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THE RELATIONSHIP BETWEEN CONCEIVED VALUE DIMENSIONS
AND PREFERENCES FOR FORMS OF INQUIRY
IN SOCIAL ISSUES

by



JOHN H. STOBBE

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EDMONTON, ALBERTA

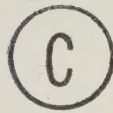
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AND PREFERENCE FOR FORMS OF INQUIRY
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JOHN H. STOBBE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
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ABSTRACT

This study investigated whether a relationship exists between value dimensions and the preference for the form of inquiry. The specific question guiding the investigation was as follows: Is there a relationship between the dimensions of conceived values of pre-service secondary school social studies teachers and their indicated preference for the form of inquiry in dealing with social issues? The relationship was sought within the framework of semiotics as theorized by Charles Morris.

It was hypothesized that a subject whose value dimension is predominantly detached will indicate preference for a form of inquiry in social issues that is predominantly designative. It was also hypothesized that a subject whose value dimension is predominantly dominant will indicate preference for a form of inquiry in social issues that is predominantly prescriptive. It was further hypothesized that a subject whose value dimension is predominantly dependent will indicate a preference for a form of inquiry that is predominantly appraisive.

In order to investigate the value dimensions, seventy-eight undergraduate students taking social studies curriculum and instruction at the University of Alberta were administered the "Ways To Live" instrument developed by Charles Morris. The responses were factor analyzed using the maximum

likelihood solution and the resulting factors were subjected to an oblique quasi-procrustean rotation. Three dimensions, dependence, dominance, and detachment, were obtained. These dimensions were a close match to Morris' three dimensions. Factor scores for each subject were determined.

The inquiry instrument developed by the investigator was used to obtain the form of inquiry preferences. Preferences for designative, prescriptive, and appraisive inquiry were measured by the subjects' responses to ten social issue displays. These responses for each form of inquiry were summed to obtain the subjects' preference.

The results indicated that although the subject was dominant in one value dimension or preferred one form of inquiry, the other dimensions and inquiry forms were also in evidence, making it difficult to say with confidence that a subject had a predominant value dimension or a preferred form of inquiry.

When correlations between the value dimensions and the forms of inquiry were computed, near zero correlation between value dimensions and forms of inquiry was found. The research hypotheses were therefore rejected. An individual whose value dimensions is predominantly dominant will have inquiry forms in social issues that may be designative, prescriptive or appraisive, and an individual whose value dimensions are predominantly dependent will have inquiry forms in social issues that may be designative, prescriptive or appraisive.

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CHAPTER I

THE PROBLEM

I. PURPOSE

The purpose of this study was to investigate empirically a dimension of the theory of semiosis postulated by Charles Morris. Morris has theorized that there is a relationship between the conceived values one holds and preference for the type of inquiry.

Morris (1964, p. 5) maintains that "experimental studies in this area are possible," but little research has been done in the area of finding a relationship. If a significant relationship indeed exists between the value dimensions one holds and the form of inquiry one prefers, the investigator believes that these findings imply new approaches to teaching and learning.

Morris (1964, p. 3) states that a person's disposition to act in a certain way under certain conditions can be interpreted in probabilistic terms. Since inquiry is a form of action, the purpose here is to make an exploration into the relationship between values and inquiry.

II. PROBLEM STATEMENT

The problem under investigation was put as follows:
Is there a relationship between the dimensions of conceived

values of pre-service secondary school social studies teachers and their indicated preference for the form of inquiry in dealing with social issues?

III. DEFINITION OF TERMS

The following terms are defined as they apply to this study.

Values

Values, as used by Morris, refers to the properties of objects or situations relative to the preferential behavior, both positive and negative, to an object or situation. A distinction is made between value as the preferred (operative value) and value as a conception of the preferable (conceived value). This study is concerned with the conceived values which can be studied through symbols.

"Ways To Live" Instrument

"Ways To Live" Instrument refers to an instrument developed by Charles Morris to determine the subject's value dimensions. If subjects rate the instruments according to its instructions, the instrument gives information primarily about conceived values. (Appendix A)

Value Dimensions

Value dimensions are derived from the "Ways To Live." The responses were factor analyzed and categorized into the following primary dimensions--detachment, dominance, and dependence.

Dimension of Detachment

The dimension of detachment is that value dimension characterized by detachment, restraint, non-commitment, and self-control. The stress is on perception and letting things happen.

Dimension of Dominance

The dimension of dominance is that value dimension characterized by domination and an attempt to control the environment. The stress is on doing and making things happen.

Dimension of Dependence

The dimension of dependence is that value dimension characterized by receptivity, responsiveness, relaxation, and emotional warmth. The stress is on being.

Inquiry

Inquiry, as used by Morris, refers to a reflective process involving signs and directed to solving problems.

Inquiry Instrument

Inquiry Instrument refers to an instrument developed by the investigator to determine the subject's preference for the form of inquiry. It consists of 10 displays made up of pictures and questions. (Appendix B)

Display

A display refers to a sign or signs consisting of objects or situations whose function is to facilitate the

intended learning outcome as established by the instructor. It is intended that the display sets up in a learner a disposition to act in a certain kind of way to the signification of the display under certain conditions (the environment or context of the situation). In the present study, the "Ways To Live" instrument and the Inquiry instrument are the two displays used.

Forms of Inquiry

Forms of Inquiry refers to those three forms designated by C. Morris as follows:

Designative Inquiry. Designative Inquiry is that process of inquiry directed to problems of what has happened, is happening, or will happen.

Prescriptive Inquiry. Prescriptive Inquiry is that process of inquiry directed to problems of what to do.

Appraisive Inquiry. Appraisive Inquiry is that process of inquiry directed to problems of what to accord preferential behavior.

Preference

Preference refers to a selection from two or more objects or situations to which different weights are assigned.

IV. NEED FOR THE STUDY

If forms of inquiry are related to value dimensions, students in social studies curriculum and instruction courses

should be taught the forms of inquiry and should be made aware of their dispositions to their own form of inquiry.

The kind of inquiry in a classroom may be the kind of inquiry the social studies teacher prefers. This preference is dependent on his value orientation, thus a teacher should be aware of his own value dimensions.

Presently there is much social studies material coming on the educational market. The development of each project is characterized by a certain approach. The forms of inquiry could be used to categorize the projects according to the emphasis given to appraisive, prescriptive, and designative, inquiry.

V. SCOPE AND LIMITATIONS

Semiosis consists of three areas--syntactics, semantics, and pragmatics. This study was limited to the pragmatics of semiosis--the uses and effects of signs. The value dimensions as determined by the "Ways To Live" instrument were correlated with the preference for the form of inquiry as determined by the Inquiry instrument. The value dimensions were limited to conceived values. Inquiry forms were limited to the three forms of inquiry referred to by C. Morris.

This study was limited to the subjects in four classes of Education Curriculum and Instruction in Secondary Social Studies (Ed. CI 266) at the University of Alberta. These students all have opted to become secondary school

social studies teachers. Only those students who were in attendance on February 16, 1971, responded to the two instruments.

VI. RESEARCH HYPOTHESES

This study is designed to test the theory postulated by Charles Morris that value dimensions are related to the preference for the form of inquiry. The following hypotheses were tested to determine whether there is such a relationship.

Hypothesis 1 - Pre-service secondary school social studies teachers whose value dimension is predominantly detached will indicate preference for a form of inquiry in social issues that is predominantly designative.

Hypothesis 2 - Pre-service secondary school social studies teachers whose value dimension is predominantly dominant will indicate preference for a form of inquiry in social issues that is predominantly prescriptive.

Hypothesis 3 - Pre-service secondary school social studies teachers whose value dimension is predominantly dependent will indicate preference for a form of inquiry in social issues that is predominantly appraisive.

VII. PLAN OF THE REPORT

A review of the literature pertaining to the transaction between the student and the display, and the conceptual aspects on which the hypotheses were based are reported in Chapter II. Chapter III outlines the procedure and Chapter IV deals with the analysis of the data, and presents the findings and implications. Chapter V is a summary of the report, and gives suggestions for further research.

CHAPTER II

CONCEPTUAL BASE FOR THE STUDY

This study emerged from interest in a segment of a curriculum and instruction design developed by M. Johnson, Jr., (1967) and adapted by T. Aoki (1970). The segment of concern to this study is instruction considered to be characterized by three processes--social interaction between instructor and students, the control process exercised in terms of intent by the instructor and directed towards students, and the transaction between students and the segment of the environmental display mediated by the instructor. Of these three the last is considered to be the crucial process. For learning, the goal of instruction, is considered to be the outcome of this transaction. Aoki has diagrammed this instructional process (see Figure 1) and has described it as follows:

transaction is complicated by the mediating presence of an instructor and other students. There is interpersonal interaction which has a large bearing on the affective climate of the social setting. Beyond that is the teacher's control tactics . . . to focus (students) on the display . . . to initiate thought and to structure thought (Aoki, 1979, p. 10).

This study is concerned mainly with the process designated as "transaction between the students and the display," which in effect is a microcosm of the interaction between man and his physical and social environment. In this transaction the instructor's task is that of mediation.

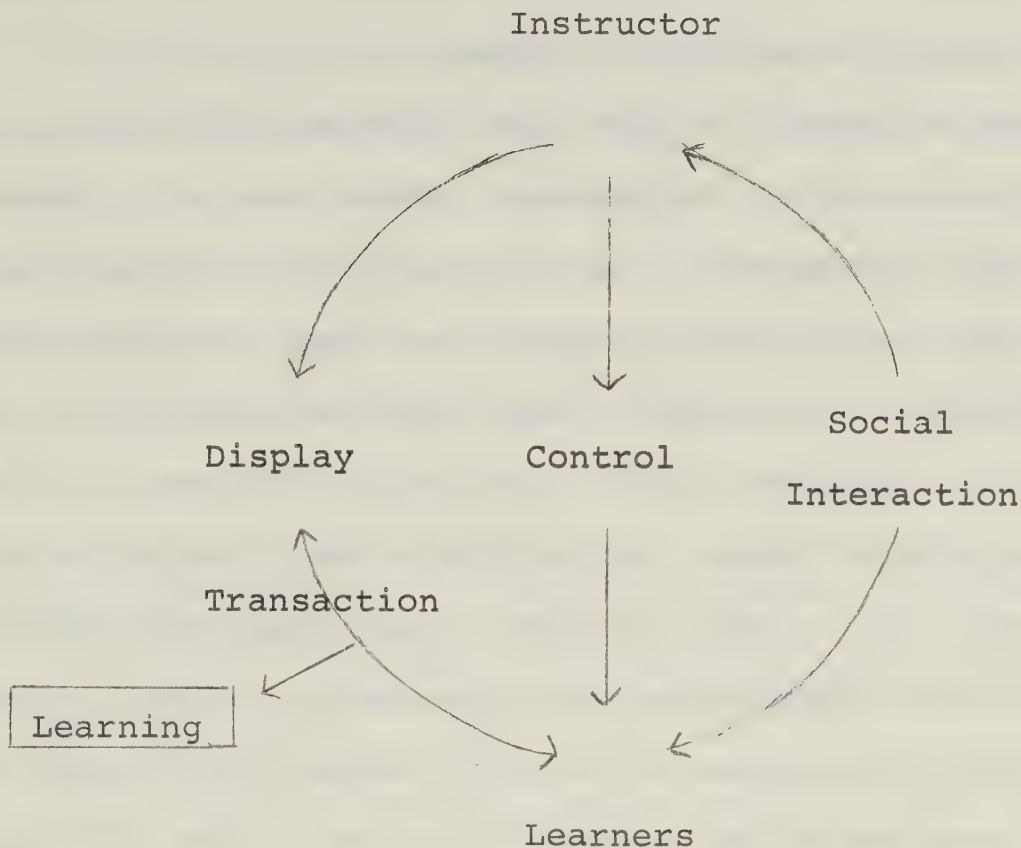


FIGURE I

THE INSTRUCTION PROCESS

Johnson says:

in the transaction . . . the instructor . . . is not a participant, but a mediator, and often, a meddler. He is a stage manager and a director, but not an actor (Johnson, 1967, p. 10).

The display with which students make contact may come in many forms, verbal and non-verbal. It may be a reading, a film, a filmstrip, picture, a talk, or a fieldtrip. In this context an instructor's lecture is considered to be one kind of display. Embedded in the display is content considered to be instrumental to the intended learning outcomes. To illuminate the character of the transaction between the students and the display is one of the main

concerns of this study.

It is in the endeavor to view more clearly, the character of transaction that Morris' theory of semiosis was invoked. In this theory transaction is conceived to be a relationship of five terms--sign, interpreter, interpretant, significations, and the context in which the signs occur. That is, a sign sets up in an interpreter a disposition to act in a certain kind of way (the interpretant) to a certain kind of object (the signification) under certain conditions in which the signs occur (Morris, 1964, p. 2). The classical example used to illustrate this relationship is that of a bee which finds nectar is able, on returning to the hive, to "dance" in such a way as to direct the other bees to the food source (Morris, 1964, p. 2). In this example, the dance is the sign; the other bees affected by the dance are the interpreters; the interpretant is the disposition to act in a certain kind of way by these bees because of the dance; the signification is the kind of object toward which the bees are prepared to act this way and the context is the position of the hive to the nectar. This formulation of semiosis is thus behavioral and the disposition to act is considered to be goal-seeking behavior. In this study the instrumental content in the display is the sign; the students affected by the instrumental content are the interpreters; the interpretant is the disposition to act in a certain kind of way by the students because of the instrumental content displayed; the signification is the kind of object toward which the

students are prepared to act this way; and the context is the classroom in which students and the display are placed.

Underlying this formulation of semiosis by Morris is the conception of man as a symbolic animal who possesses the capability of high-level sign processes. Signs, according to him, play their part within the context of the goal-seeking behavior of man.

A sign, says Morris,

is that something that directs behavior with respect to something that is not at the moment a stimulus. If anything, A, is a preparatory-stimulus that, in the absence of the stimulus-objects initiating response-sequences of a certain behavior-family, then A is a sign (Morris, 1946, p. 354).

The sign in effect sets up action which is viewed as goal-seeking behavior. All action is seen as having to meet three requirements:

the actor must obtain information concerning the situation in which he is to act, he must select among objects that he will favor or accord positive or preferential behavior, and he must act on the selected object by some specific course of behavior (Morris, 1964, p. 7).

In this relationship of signs and action, signs differ in the kind of significations they have. G. H. Mead (1938, pp. 3-23), upon whom Morris has built, views signification as being tridimensional in the following way. If an impulse is given by a sign, the resulting action can be perceptual, manipulatory or consummatory. A sign is designative when it signifies the observable properties; a sign is appraisive when it signifies the consummatory properties; and a sign is prescriptive when it signifies how

the object or situation is to be reacted to so as to satisfy the governing impulse.

Morris (1956, p. 192) maintains that the expectation would be for designative signs to be predominant in the perceptual stage of the act. Impulses are not simply indulged; behavior is wary, restrained, not yet totally committed. The search for, and guidance by, signs gives this phase a strongly cognitive character. Prescriptive signs would be predominant in the manipulatory stage of the act. The actor is committed to an object, acts upon it, and initiates changes in it. Appraisive signs would be predominant in the consummatory stage of the act. The organism must now let the object act upon it if the impulse is to be fulfilled. Receptivity to the object is called for.

A sign takes on significance for the interpreter when he is disposed to perceive, manipulate, or consummate because of the sign. In designative signs, the interpretant would be a disposition to perceive the designated object as if it had observable properties; in appraisive signs, the interpretant would be a disposition to accord preference toward a designated object as if it would be satisfying or unsatisfying; in prescriptive signs the interpretant would be a disposition to manipulate in a certain kind of way to the designated object. The theory thus posits that there is a relationship between signification, significance and human behavior.

According to Morris, the kinds of dispositions are

related to preferential behavior, which is the basis of his axiological position. A value situation as used for the purpose of this study is regarded as any situation in which preferential behavior occurs. Thus, values are properties of objects or situations relative to preferential behavior. Three aspects of values are explicated in the definition--value of the preferred (operative value), value or the conception of the preferred (conceived value), and value of the preferable (object value). This study is restricted to conceived values.

Beyond that, Morris (1946, p. 192) postulates that there are three dimensions of value--dependence, dominance, and detachment (as measured by the "Ways To Live" instrument) that are related to the significations. In the perceptual stage of the act, the detached value dimension is involved; in the manipulatory stage of the act, the dominant value dimension is involved; in the consummatory stage of the act, the dependent value dimension is involved. Actions differ to the extent to which the three dimensions predominate. For persons whose main activity is perception, the signs are predominantly designative and the value dimension predominantly dominance. For persons whose main activity is at consummation, the signs are predominantly appraisive and the value dimension predominantly dependence.

Another concept related to this study is Morris' conception of inquiry. Inquiry, as used for the purpose of this study is regarded as a reflective process involving

signs and directed at solving a problem. Continuing with Morris' proposition, inquiry may be undertaken with regard to any of the phases of action, perceptual, manipulative, and consummatory. Therefore, there are three main forms of problems to which inquiry is directed, and three forms of inquiry.

Designative Inquiry

Designative inquiry concerns problems of what has happened, is happening, or will happen. The signs are primarily designative. This form of inquiry terminates with designative statements. Science is commonly thought of as designative inquiry.

Prescriptive Inquiry

Prescriptive inquiry concerns problems of what to do. The signs are primarily prescriptive. This form of inquiry terminates with prescriptive utterances. Technology commonly is thought of as prescriptive inquiry.

Appraisive Inquiry

Appraisive inquiry concerns problems of what to accord preferential behavior. The signs are primarily appraisive. This form of inquiry terminates with appraisive utterances. Critics are commonly thought of as having appraisive inquiry.

The basic relations of the stages of action, dimensions of signifying, dimensions of value, and forms of inquiry are exhibited in Figure II (Morris, 1964, p. 27).

Stage of Action	Dimension of Signifying	Dimension of Value	Form of Inquiry
Perceptual	Designative	Detachment	Designative
Manipulatory	Prescriptive	Dominance	Prescriptive
Consummatory	Appraisive	Dependence	Appraisive

FIGURE II

FORMS OF INQUIRY RELATED TO ACTION,
SIGNS, AND VALUES

It is this theoretical relationship between the value dimensions one holds and the form of inquiry one prefers that is of central concern in this investigation. Thus if the instrumental content in the display is seen as a sign, the students in their transaction with the display can be expected to be disposed to act in a certain kind of way to the object or situation.

The current trend in social studies curriculum development emphasizes prescriptive and appraisive inquiry. Displays are used in the social studies classroom to investigate social issues. Programs, such as the Harvard Social Studies Project (Oliver and Shaver, 1966), have been developed so that students may explore social issues in terms

of their appraisive and prescriptive positions. Teachers can utilize such displays so that the student can pursue the form of inquiry he prefers in accordance with his value dimensions.

There is also a trend in social studies education to use displays as instrumental content. The secondary social studies curriculum and instruction courses at the University of Alberta are placing more emphasis on the use of displays as instrumental content. Students must become familiar with the theory of signs to understand a relationship of signs with values and inquiry.

There is currently a preponderance of social studies displays appearing on the educational market. The preparation of each display is characterized by a certain approach. Some displays, such as the Amherst History Project, are concerned primarily with designative inquiry. Other displays, such as the Dangerous Parallel simulation game, are concerned primarily with prescriptive inquiry. Still other displays, such as the tapes on Values, are concerned primarily with appraisive inquiry. There is a need to examine the available displays in terms of preferential behavior postulated by Morris.

The theory of semiosis is related to social studies education in that the form of inquiry used in the classroom may be the form of inquiry the social studies student teacher prefers. On the basis of the theory, a student teacher's inquiry preference is dependent on his value orientation.

The student teacher whose value dimension is detached, would prefer a designative form of inquiry; the student teacher whose value dimension is dominant, would prefer a prescriptive form of inquiry; and the student teacher whose value dimension is dependent, would prefer an appraisive form of inquiry. A similar statement could be made about each student in a social studies classroom.

Thus, this study is seen as a problematic situation within the context of semiosis to determine whether a relationship exists between value dimensions and the preference for the form of inquiry. There are four components that had to be attended to. First, the display, defined as a sign to set up a disposition to act in a certain kind of way under certain conditions; second, subjects associated with secondary social studies curriculum and instruction who were involved in social issues, values, and inquiry; third, the development of an inquiry instrument in social issues to determine the preference for forms of inquiry incorporating the three forms of inquiry, and fourth, an instrument to determine value dimensions.

These considerations emerging from Morris' theory of semiosis led to the formulation of the three research hypotheses on page 6.

CHAPTER III

METHOD OF INVESTIGATION

An attempt was made in the preceding chapter to explore the theoretical aspects of the relationship between the value dimension one holds and the form of inquiry one prefers to pursue within the framework of semiotics. This chapter describes the instruments used to collect the data, the subjects used, the data gathering procedures, the recording of the data obtained, and the method used to analyze the data to determine the relationship between value dimensions and inquiry preferences.

I. INSTRUMENTS

"Ways To Live" Instrument

The "Ways To Live" instrument, developed by Charles Morris, was used to determine value dimensions held by the subjects in this study. A copy of this instrument is found in Appendix A. It is a cross-cultural scale consisting of 13 paragraphs, each portraying a way of life. Morris (1956, p. 1) has given a brief characterization of the thirteen Ways as follows:

- Way 1: preserve the best that man has attained
- Way 2: cultivate independence of persons and things
- Way 3: show sympathetic concern for others
- Way 4: experience festivity and solitude in alternation

- Way 5: act and enjoy life through group participation
- Way 6: constantly master changing conditions
- Way 7: integrate action, enjoyment, and contemplation
- Way 8: live with wholesome, carefree enjoyment
- Way 9: wait in quiet receptivity
- Way 10: control the self stoically
- Way 11: meditate on the inner life
- Way 12: chance adventuresome deeds
- Way 13: obey the cosmic purposes

The subjects were asked to respond to each paragraph on a seven-point scale about their conceived values, that is, their conception of the good life. '7' is a synonym of 'like very much,' and '1' is a synonym for 'dislike very much.'

The thirteen alternatives were numbered and not named. This was done so as not to prejudice the subjects in seeing a relation between religious and ethical systems. The thirteen Ways are positive in tone, normal rather than abnormal, constructive rather than destructive.

The final version of the instrument has been administered in the United States, India, China, Japan, Norway, and Canada by Morris and his associates. Most of the testing was done on United States, Chinese, and Indian samples. It was from the analysis of the data from these countries that Morris drew his main conclusions.

Morris found the "Ways To Live" instrument to be a

valid measure of value dimensions. Reliability (Morris, 1965, p. 5) of ratings of the instrument for college students is 0.85. Ratings by twenty students had an average product-moment correlation of 0.87 with ratings made by them three weeks earlier. A retest by thirty college students after a fourteen week interval gave an average correlation of 0.78.

Inquiry Instrument

The inquiry instrument was designed by the investigator to determine the inquiry preference held by the subjects. The instrument consisted of ten displays made up of a picture and three stated questions for each display. A copy of this instrument is found in Appendix B.

A sample of ten pictures was selected from magazines and social studies projects portraying social issues in North America today. Slides, in black and white, were taken of the pictures so they could be displayed on a projection screen. A Kodak Instamatic camera was used. The slides may be denoted as follows:

- Picture I: Welfare
- Picture II: Poverty
- Picture III: Children play on streets
- Picture IV: Police arresting a suspect
- Picture V: Door-to-door salesman
- Picture VI: Life in prison
- Picture VII: Drugs
- Picture VIII: Crowd control

Picture IX: Alcoholism

Picture X: Protection of parliament buildings

Three types of questions--designative, appraisive, and prescriptive--were presented with each slide.

The questions for the instrument were devised with the help of senior education students and graduate students. Questions were submitted by fifteen senior education students who were familiar with Morris' inquiry forms. Each student submitted a designative, prescriptive, and appraisive question for each picture. Of the questions submitted, a representative sample was chosen by the investigator. Four graduate students were then independently asked to categorize the selected questions according to the three forms of inquiry. If there was not total agreement in the categorization, the question was changed until all four students agreed with the inquiry form portrayed by the questions.

The three questions for each display were randomly ordered by means of a die.

Each subject was asked to respond to each display and indicate to what extent he would prefer to pursue the three questions. For the question he preferred the most the subject was to place a '5' in the space provided before that question. For the question he preferred quite a lot the subject was to place a '3' in the space provided before that question and for the question he preferred slightly he was to place a '1' in the space provided for that question.

Reliability of the ratings of the inquiry instrument

was determined by the test-retest method. Five fourth year education students were used as judges. They were tested, then retested one week later. Instructions given to the judges were similar to those given to the subjects. To compute the reliability, two methods were used. The same scale, 5, 3, and 1 was used. Method I was computed by summing the preferences that were in agreement in the test-retest. If the judge agreed in the retest with the preference indicated in the first test, a weight of 1 was given. Each of the five judges' agreements was summed and divided by 30, the number of items. This was taken as the reliability score.

The difficulty in using Method I was that the reliability was depressed in that once two preferences had been designated, the third was fixed, that is, the ratings were not independent. Therefore, Method II was used as an alternative. If there was agreement on the test-retest, a weight of 1 was given; if the disagreement was between "slightly" and "quite a lot" or between "quite a lot" and "the most" a weight of $1/2$ was given; if the disagreement was between "slightly" and "the most" no weight was given. Each of the five judges' $1/2$'s and 1's were summed and divided by 30, the number of items, to yield the reliability score. Method II yielded a somewhat inflated estimate of reliability as too much weight may have been given for the disagreement. Table I indicates the test-retest reliability of the inquiry instrument for each of the two methods that were used.

TABLE I

RELIABILITY OF INQUIRY INSTRUMENT
FOR THE FIVE JUDGES USING TWO
COMPUTATIONAL METHODS

Judges	1	2	3	4	5
Method I	.53	.50	.77	.93	.73
Method II	.67	.70	.87	.97	.87

It must be noted that judges 1 and 2 have low reliability ratings. The investigator observed that during the administration of the retest these two judges were not attending to the task which could have been the cause for the low reliability ratings of judges 1 and 2.

The overall reliability by Method I is 0.69; for Method II it is 0.82. The results point out that the difference in reliability of the two methods is not great. It may be concluded that the actual reliability of the preference designation is probably between 0.69 and 0.82.

II. DESCRIPTION OF SUBJECTS

The investigator is particularly concerned with work being done in the social studies curriculum and instruction area where the focus is on issues and inquiry. The subjects for this study were 78 students from the University of Alberta taking undergraduate Secondary Social Studies Curriculum and Instruction (Ed. C. and I. 266) who were in attendance on February 16, 1971. There is no reason

to believe that this is not representative of a larger hypothetical population of third and fourth year social studies C. & I. students. There were two morning classes and two afternoon classes. All subjects were in the third or fourth year of university. All students present were included in the study in order that there would be enough subjects in each value dimension. It was hoped that each value dimension would be represented so that generalizations and inferences could be made from the results.

III. METHOD OF COLLECTING DATA

To ensure uniformity in test procedures, the investigator combined the two morning classes and tested them, and repeated the testing with the combined two afternoon classes. The inquiry instrument was given first. For clarification of procedure, the instructions were written on the answer sheet and were also read by the investigator to the subjects. As each display was shown on the screen the subjects responded to the three questions for that picture printed on their answer sheet. The investigator chose this method because it would be more convenient for the subjects to have all three questions at their own disposal for referral, whereas, if the questions were read from the screen, confusion could occur. The time allowed for viewing each slide and for writing the responses was one minute. It was found that the subjects had sufficient time to view the slide and to record the response.

Inquiry preference was measured by the inquiry instrument which determined the disposition to act to the signs in a preferred way. Because signs have certain signification at a given moment in time, it was necessary to determine the value dimensions by administering the "Ways To Live" instrument immediately after the inquiry instrument. Instructions were written on the instrument and read to the subjects. The subjects were allowed as much time as they needed for the "Ways To Live" instrument which took approximately forty minutes to complete.

IV. RECORDING THE DATA

All the subjects' responses to the inquiry instrument and the "Ways To Live" instrument were recorded on an information sheet. The responses to the instruments appear in Appendix C.

V. METHOD OF DATA ANALYSIS

The intercorrelations among the ratings for the 13 "Ways To Live" were subjected to factor analysis to obtain a three-dimensional configuration consistent with the value dimensions of dominance, dependence, and detachment reported by Morris and Jones (1955). The subjects were characterized in terms of the three dimensions obtained by computing their factor scores. The inquiry preference of each subject was obtained by determining the average rating for each form of inquiry.

The relationships between value dimensions and the inquiry forms were established by correlational methods.

V. THE NULL HYPOTHESES

Based on the assumption that value dimensions and preference for the form of inquiry would emerge in the factor analysis and subsequent correlational procedures, the hypotheses were stated in the null form.

Null Hypothesis 1 - For those pre-service secondary social studies teachers whose value dimension is predominantly detached, there will be no significant correlation between indicated preference for designative inquiry and indicated preference for appraisive inquiry and for prescriptive inquiry.

Null Hypothesis 2 - For those pre-service secondary social studies teachers whose value dimension is predominantly dominant, there will be no significant correlation between indicated preference for prescriptive inquiry and indicated preference for designative inquiry and for appraisive inquiry.

Null Hypothesis 3 - For those pre-service secondary social studies teachers whose value dimension

is predominantly dependent, there will be no significant correlation between indicated preference for appraisive inquiry and indicated preference for designative inquiry and for prescriptive inquiry.

CHAPTER IV

RESULTS AND DISCUSSION

I. IDENTIFICATION OF THE VALUE DIMENSIONS

This chapter describes the results of the study as derived from the analysis of the data. The first part presents a description of factor analysis and the methods used in Morris' study and the present study. The results of the two methods are compared and contrasted. The second part deals with the statistical results as the basis for the decisions concerning the hypotheses under investigation.

General Description of Factor Analysis

The aim of factor analysis is to determine the smallest number of factors that will account for the inter-correlations among a number of variables, thus facilitating the identification of any underlying variables.

Factor analysis begins with a set of observations obtained from a given sample by means of some measure. The data from the intercorrelations among these variables are analysed to determine whether the variance represented can be accounted for adequately by a number of basic categories or dimensions smaller than that with which the investigation began (Fruchter, 1954, p. 1). The factors are interpreted by observing which variables fall on a given dimension and inferring what these variables have in common. Variables correlate to the extent that they reflect underlying common

traits. By observing and analyzing the pattern of inter-correlations, the underlying source of common variance is inferred.

The simplest mathematical model for describing a variable in terms of other variables is linear. A researcher has several alternatives available within the linear framework. An analysis could be performed which would best reproduce the correlations between the variables or one which would extract the maximum variance from the variables. The algebraic model may be represented as:

$$Z_{ji} = a_{j1}F_{1i} + a_{j2}F_{2i} + a_{j3}F_{3i} + \dots + a_{jr}F_{ri}$$

where

Z_{ji} - standard score for person i on test j

a_{jr} - factor loadings of test j on component r

F_{ri} - factor score for person i for component r

The observed variables are now described linearly in terms of factors (F_{ri}). Each successive factor makes a maximum contribution to the sum of the variables that is residual after preceding factors have been extracted.

A parsimonious expression of the above model may be represented in matrix notation as:

$$Z = AF$$

where

Z = standard score matrix of order $(n \times N)$

A = a matrix of factor loadings of order $(n \times r)$

F = a matrix of factor scores of order $(r \times N)$

and

N = number of observations

n = number of variables

r = number of factors

Computationally, analysis proceeds from the correlation matrix R , ($n \times n$). Thus if $Z = AF$ is post-multiplied by its transpose and then divided by N , the number of observations, the correlation matrix R is formed.

$$Z = AF$$

$$\frac{Z Z'}{N} = \frac{AF F' A'}{N}$$

If the component scores are scaled with zero mean and unit variance and are orthogonal, then $\frac{FF'}{N} = I$, the identity matrix, and the expression reduces to $R = AA'$.

By establishing the basic sources of variance it may be possible to determine what types of traits the variables are measuring and the interrelationships among these measures.

Method Used by Morris and Jones

Numerous methods are available to factor analyze data. Morris and Jones (1955) computed the product-moment correlation coefficients among the "Ways To Live," utilizing integers from 1 to 7 to characterize the seven response categories. The centroid factor solution was used to obtain the factors. The centroid method is a computational compromise for the principal-factor solution but with considerable savings of labour. It attempts to account for as much as possible the total variance by each successive

factor. The first factor accounts for the maximum possible variance, the second factor accounts for a maximum in the residual space with the first factor removed; the third factor accounts for a maximum in the residual space excluding the first two factors; and so on until a last common factor accounts for whatever communality remains (Harman, 1967, pp. 171-184).

In the centroid solution of factor analysis, the variables may be regarded as a set of n vectors contained in a space of m dimensions, where m is the number of common factors. The n variables may also be regarded as represented by the m coordinates of the end points of these vectors with respect to m mutually orthogonal arbitrary reference axes. The arbitrary coordinate system is in effect rotated so that the centroid point of the set of n points, in conjunction with the origin, determines the first axis of reference. The projection of each of the vectors on the first axis of reference of the centroid (the coordinate or coefficient of each variable) is then obtained.

The second coordinate is found from the first factor residuals. However, in the $(m-1)$ residual space, the centroid is at the origin and the $(m-1)$ coordinates of the centroid of the n points all vanish. In order that the values of the second-factor coefficients may be calculated, the centroid is removed from the origin. This is accomplished by rotating certain of the vectors through 180° about the origin by changing the signs of the correlations of these

variables in the residual space. Although rules are available, the decision as to which specific variables to reflect remains subjective. Different choices will yield different centroid solutions, and the centroid method is not unique for a given set of variables.

Replication of the Morris and Jones study was not feasible since they did not provide information as to which variables were reflected at the various stages in obtaining the final five factor centroid solution. In the Morris and Jones study, centroid factor solutions were obtained twice, the second and final solution utilizing the communality estimates obtained from the first solution. Successive two-dimensional graphic rotations to simple structure yielded the final orthogonal factor solution. The rotation was carried out according to the graphical procedures introduced by Zimmerman (1946, 11, pp. 51-56). The analysis showed that five independent factors were present (Jones and Morris, 1955, pp. 527-528).

Factor A: Social Restraint and Self-Control.

Factor B: Enjoyment and Progress in Action.

Factor C: Withdrawal and Self-Sufficiency.

Factor D: Receptivity and Sympathetic Concern.

Factor E: Self-Indulgence (or Sensuous Concern).

Factor A, Social Restraint and Self-Control, includes Ways 10, 1, 3, and -4. It accounts for 5.3% of the total variance. Factor B, Enjoyment and Progress in Action, includes Ways 5, 12, 8, -10, -2, and -11 and accounts for 9.2% of the total

variance and 27% of the common factor variance. Factor C, Withdrawal and Self-Sufficiency, includes Ways 9, 2, 11, and -6, and accounts for 7.2% of the total variance and 21% of the common variance. Factor D, Receptivity and Sympathetic Concern, includes Ways 13, 3, 10, 5, -2, and -4. It accounts for 7.4% of the total variance and 22% of the common variance. Factor E, Self-Indulgence, includes Ways 4, 12, and -3 and accounts for 4.9% of the total variance and 14% of the common variance. Factor loadings of 0.25 or above and -0.25 or below were taken into account in interpreting the factors. Table II shows the Morris and Jones rotated factor structure of the U.S. population sample (Morris, 1956, p. 32).

TABLE II

UNITED STATES ROTATED FACTORS (MORRIS AND JONES)

Way	I	II	III	IV	V	Commun- ality
1	.51	-.03	-.05	.02	-.02	190
2	.10	-.28	.50	-.11	.20	472
3	.25	.01	-.05	.34	-.03	383
4	-.44	.12	.10	-.11	.38	419
5	-.04	.34	-.36	.20	.07	418
6	.17	.30	-.18	-.06	.02	170
7	-.07	-.19	.02	-.18	.20	058
8	-.12	.02	-.08	.09	.44	220
9	-.03	-.09	.26	.47	.19	391
10	.41	.14	.22	.09	-.25	501
11	-.10	-.17	.54	-.02	-.02	421
12	.04	.58	.00	-.01	.01	351
13	.07	.02	.15	.51	-.27	413
% of trace	5.3 %	9.2 %	7.2 %	7.4 %	4.9 %	(340)

Morris, in his earlier studies, had been concerned with three value dimensions and his objective was to isolate the factors to correspond with the dimensions. The three earlier dimensions were characterized as Dependence, Dominance, and Detachment and are similar to the basic categories of Sheldon, Freud, Fromm, and Harney (Morris, 1956, p. 28). In an attempt to clarify and objectify the problem of having the the three value dimensions match the five factors, Morris had 29 students rate the thirteen "Ways To Live" in terms of three unnamed categories and found that the students were able to distinguish the three categories which correspond to the three dimensions of Dependence, Dominance, and Detachment, identified earlier. Consequently, Morris argued that the five factors could be regarded in terms of the three dimensions. Examination revealed the value dimensions were not primary dimensions, but higher order abstractions containing at least two factors. When the 29 students had rated the 13 Ways, Ways 8, 9, 13, 3, and 4 were placed in category I, Dependence. Factor analysis had pulled the category apart into two groups, yielding highest coefficients on Factor E, self-indulgence, for Ways 8 (wholesome enjoyment), and 4 (festivity and solitude in alteration). The highest coefficients of Factor D, receptivity and sympathetic concern, were Ways 13 (obey cosmic purposes), 9 (receptivity), and 3 (concern for others). This suggested to them that there is a relationship between Factors E and D. Ways 12 (adventure), 6 (master changing conditions), and 5 (enjoy life through

group participation) were placed in category II, Dominance, by the 29 students. Factor B included these Ways. Similarly, the students placed Ways 2 (independence of persons and things), 11 (meditate on inner life), 10 (stoic self-control), and 1 (preserve the best that man has attained), in category III, Detachment. These were again separated in factor analysis. Highest coefficients on Factor C, withdrawal and self-sufficiency, were Ways 11 (meditate on inner life) and 2 (independence of persons and things) and highest coefficients on Factor A, social restraint, were Ways 10 (stoic self-control) and 1 (preserve the best that man has attained). This suggests that there is also a relationship between Factors C and A.

Morris (1956, p. 38) suggested that fission occurs along a common line in the factor analysis. Factor A, social restraint, Factor B₁, enjoyment and progress in action,^{*} and Factor D, receptivity and sympathetic concern, all involve a reference point other than self--whether it be other persons, society, or nature. Ways 1 (preserve the best that man has attained) and 10 (stoic self-control) in Factor A, social restraint, are social in orientation. Ways 5 (enjoy life),

* Factor B (B₁ and B₂) enjoyment and progress in action, is split into two related but distinguishable factors, B₁ and B₂. The high coefficients on Factor B₁ are Ways 5 (enjoy life through group participation), 3 (concern for others), and 6 (master changing conditions). The high coefficients for Factor B₂ are Ways 12 (adventure), 6 (master changing conditions), and 13 (obey cosmic purposes). Way 6 is common to both factors. Ways 5 and 3 give Factor B₁ an orientation towards specific problems of persons and society. Factor B₂ is dominated by Way 12. Both Factors B₁ and B₂ stress activity.

3 (concern for others), and 6 (master changing conditions), in Factor B₁ are oriented to society. Ways 9 (receptivity), and 13 (obey the cosmic purposes), in Factor D, sympathetic concern, contain reference to nature and society.

In contrast, Factors C, withdrawal and self-sufficiency, B₂, enjoyment and progress in action, and E, self-indulgence, the reference point is to some state or activity of the self. The factors are characterized by wholesome enjoyment of life (Way 8), festivity and solitude (Way 4), adventure (Way 12), meditate inner life (Way 11), and independence of persons and things (Way 2).

Morris (1956, p. 191) argues that both Factors D, receptivity and sympathetic concern, and E, self-indulgence, involve Dependence in the sense of receptivity, responsiveness to stimuli, and acceptance. But in Factor E it is the immediate situation which is accepted, while in Factor D, receptivity is directed toward nature, toward the man-cosmos relation, or to the needs of other persons. Detachment involves restraint, self-control, and deliberation. But in Factor C this restraint of the self is directed at the purposes of the self, while in Factor A it is enlisted in the service of social causes. Dominance involves action of the world, the initiator of changes, outwardness of orientation. In Factor B₁ the action is for the sake of the actor, while in Factor B₂ the action is directed to achieve social goals.

Table III exhibits the relationship of the factors and dimensions as portrayed by Morris. Category I is the

dimension of Dependence. It contains Factors E, self-indulgence, and D, receptivity and sympathetic concern. Category II is the dimension of Dominance and contains Factors B₂ and B₁, enjoyment and progress in action. Category III is the dimension of Detachment and contains Factors C, withdrawal and self-sufficiency, and A, social restraint and self-control.

TABLE III

VALUE FACTORS CLASSIFIED ACCORDING
TO TYPE OF ORIENTATION

Category Dimension	Orientation to Self	Factors	Orientation to Other than Self
I Dependence	Factor E (Ways 8, 4 -10, -13)*		Factor D (Ways 13, 9, 3)
II Dominance	Factor B ₂ (Ways 12, 6, -1)		Factor B (Ways 5, 3, 6, -2)
III Detachment	Factor C (Ways 11, 2, 9, -5)		Factor A (Ways 1, 10, 3, -4)

* (Negatives signify the antithesis of the trait).

Methods Used in the Present Study

Morris and Jones used the centroid solution and graphical rotation procedure to arrive at a five factor solution. Modern computers have made this method impractical and numerous factor analytic procedures are available which yield mathematical solutions. From such solutions a

determination can be made as to the number of factors that are significant to a study. The procedure used in the present study identified the three dimensions--Dependence, Dominance, and Detachment--directly, whereas Morris and Jones identified five factors and subsequently characterized the three dimensions in terms of these factors. The investigator felt that if Morris' five factors were in fact three dimensions, it should be possible to factor analyze the "Ways To Live" and obtain the three dimensions directly. These dimensions should be similar to Morris' three dimensions of Dependence, Dominance, and Detachment. In the remainder of this chapter, factors will refer to those five factors, A, B, C, D, and E, obtained by Morris in his study. Dimensions will refer to the three dimensions, Dependence, Dominance, and Detachment, identified by Morris and obtained in factor analysis in the present study. The remainder of this section describes the method used.

An unrotated orthogonal factor matrix of three factors was obtained by the maximum likelihood procedure. This matrix was rotated using the oblique quasi-procrustean method to yield three dimensions that exhibit a satisfactory degree of agreement with the three dimensions, Dependence, Dominance, and Detachment identified by Morris. This procedure was regarded as preferable as it yielded the three dimensions directly and approximated the value dimensions used in Morris' theory.

Maximum likelihood solution. The maximum likelihood solution (Joreskog, 1968, pp. 85-96) was used to obtain an unrotated factor matrix of the three dimensions. The maximum likelihood procedure was selected because it provides a statistical test for determining a specified number of factors to explain an empirical correlation matrix (Lawley and Maxwell, 1963).

The maximum likelihood method is a statistical technique for the estimation of factor loadings. These estimates are regarded as preferable to other estimates as there is available a statistical test of significance concerning the number of factors required to explain the observed correlation coefficients. The maximum likelihood approach (Harman, 1967, Ch. 10) to factor analysis requires that a distinction be made between the intercorrelations of the observed variables and the hypothetical values in the universe from which they were sampled. The method of maximum likelihood is a well-established but algebraically complex statistical procedure for estimating the unknown population parameters. Estimates (in terms of a likelihood function) for the universe factor weights under the assumption of the factor model described earlier are obtained and the statistical significance of such hypotheses is determined. (The reader is referred to Joreskog and Chapter 10 of Harman for the details).

Estimators of the universe factor loadings from the sample of N observations on the n tests (in this study,

the Ways To Live) are obtained under the assumption of a given number (m) of common factors. A test of significance for the adequacy of the hypothesis regarding the number of factors can be applied. Since the maximum likelihood method of estimation leads to a likelihood ratio which is asymptotically distributed as Chi square, this statistic may be used as a large-sample test of the number of common factors used in the estimation. If the obtained Chi square is significantly large, the hypothesis is rejected in favor of some larger number of factors.

In this study, a confidence level of $p < 0.05$ was selected and the smallest value of m which yielded a non-significant Chi square was taken as the number of common factors.

On the basis of the study by Morris and Jones, it was hypothesized that no more than three factors would be required to reproduce the observed correlation matrix to within sampling error and that these three factors would correspond to the dimensions isolated by Morris (see Table III). The intercorrelations of the 13 "Ways To Live" which constituted the basic data to be analyzed are presented in Table IV. The unique variances (that portion of the total variance which a given variable does not have in common with any other variables) obtained by the maximum likelihood procedure are presented in Table V and the unrotated factor matrix is given in Table VI.

Solutions for one and two factors yielded significant

TABLE IV

INTERCORRELATIONS OF 13 WAYS TO LIVE

	1	2	3	4	5	6	7	8	9	10	11	12	13
1													
2	15												
3	-08	02											
4	01	-03	-11										
5	02	-07	-04	23									
6	17	09	01	02	09								
7	-29	-18	-09	18	-05	-12							
8	-02	-02	-09	22	20	-07	01						
9	06	35	12	12	03	-26	-02	17					
10	09	37	-09	-13	-01	07	-07	-23	12				
11	06	34	11	06	-07	-23	04	09	46	06			
12	16	-09	-20	20	15	18	-23	21	-12	-22	-16		
13	21	02	-01	-07	13	-11	-13	00	05	12	19	-14	

*Decimal places omitted

TABLE V

UNIQUE VARIANCES

Variable	Variance
1	.79
2	.54
3	.95
4	.81
5	.91
6	.76
7	.79
8	.73
9	.44
10	.67
11	.59
12	.44
13	.96

TABLE VI

MAXIMUM LIKELIHOOD UNROTATED FACTOR MATRIX

	I	II	III
1	.06	.26	.37
2	.55	.15	.36
3	.16	-.15	-.05
4	-.03	.35	-.24
5	-.09	.26	-.05
6	-.27	.08	.40
7	.01	-.24	-.39
8	.00	.42	-.30
9	.68	.28	-.16
10	.33	-.18	.43
11	.61	.15	-.13
12	-.41	.61	.11
13	.18	-.02	.08

Chi- square of 33.38 was obtained with a probability of 0.83. It was concluded that the three factor solution may be considered as satisfactory for reproducing the observed correlation matrix.

Oblique Quasi-Procrustean Rotation. It is sometimes necessary to rotate factor matrices if one wants to interpret them adequately. The original factor matrices are arbitrary in the sense that an infinite number of reference axes can be found to reproduce any given matrix. It is the configurations of the variables in the factor space that are of fundamental concern. In order to assist in interpreting these configurations adequately, the arbitrary axes may be rotated. Morris and Jones (1955, p. 528) used the Zimmerman method of rotation. This method is a graphical rotation in which all combinations of pairs of axes must be plotted by hand. However, computers can now perform rotations much more efficiently.

Morris and Jones (1955, p. 528) used an orthogonal rotation to obtain a five factor solution. In the present study, an oblique rotation was used since the purpose was to match Morris' three dimensions as closely as possible and it was felt that an oblique rotation would produce dimensions similar to the dimensions identified by Morris. Factor structures can generally be better fitted with oblique rotations. The specific rotation used is the oblique quasi-procrustean solution (Hakstian, 1971). This oblique

quasi-procrustean solution consistently yields a clean and readily interpretable solution for various kinds of data (Hakstian, 1971, p. 3).

The aim of the procrustean solution is to find the transformation which, when applied to some preliminary matrix (in this case, the unrotated, maximum likelihood factor matrix) yields a solution matrix that is, according to some criterion, the closest fit to a target matrix. Variables must be found to be consistently salient or have large (in absolute values) projections of the factor axes. Once the salient variables have been determined, a simple structure representation may be obtained by maximizing their separation, known as the maximal mean difference (Hakstian, 1971, p. 5). The mean difference criterion is generally maximized to very large values for the salient variables and values only moderately close to zero for potential hyperplane variables. A weighting factor of 50 is used in the maximization procedure. This weighting factor assigns equal importance to increasing the salient coefficients in absolute value and lowering the non-salient. For each factor, the variables that consistently have large (in absolute value) loadings over several solutions may be identified as salient for that factor, the remaining non-salient variables being relegated to that factor's hyperplane. No rule has yet been developed to what constitutes consistently large loadings.

The unrotated factor matrix was submitted to the oblique quasi-procrustean factor transformation. This

was to ascertain the extent to which the hypothesis--Morris' three dimensions would emerge--was substantiated. The target matrix used was the information in Table III, The Value Factors Classified According to Type of Orientation. Variables 8, 4, 13, and 9 were considered salient for factor I for the rotation. The others were to be considered non-salient. Variables 12, 6, 5, and 3 were considered salient for factor II and variables 11, 2, 1, and 10 were to be considered salient for factor III.

The procedure is characterized essentially as hypothesis confirmation in that if the obtained solution is "close" to the target matrix, one concludes that the hypothesis manifested in the target matrix has been confirmed. Closeness has not been operationalized at present (Hakstian, 1971, p. 2) but the obtained solution was considered close if the highest factor loadings on the factor pattern matrix matched the highest factor loadings on the target matrix.

Table VII presents the primary-factor pattern matrix. Table VIII presents the matrix of correlations among the oblique primary factors. The figures opposite the variables give the coefficient (factor loadings) of each variable on each factor.

The match between Morris' three dimensions and the present study is sufficiently similar that they may be regarded as being essentially the same. The variables receiving the highest coefficients in the present study were generally the same variables that received the highest

TABLE VII

PRIMARY-FACTOR PATTERN MATRIX

Variables	I	II	III
1	-.11	.42	.47
2	-.14	.13	.76
3	-.04	-.22	.02
4	.46	.19	.18
5	.22	.24	.05
6	.33	.41	.24
7	.17	-.44	-.44
8	.58	.20	-.19
9	.43	-.12	.36
10	-.46	-.05	.62
11	.31	-.19	.32
12	.31	.76	-.03
13	-.06	-.05	.19

TABLE VIII

MATRIX OF CORRELATIONS AMONG PRIMARY FACTORS

	I	II	III
I			
II	-.29		
III	.49	-.46	

loadings in Morris' study. Dimension I, Dependence, is characterized by variables 4, 8, 10, 9, and 6. Dimension II, Dominance, is characterized by variables 12, 7, 1, and 6. Dimension III, Detachment, is characterized by variables 2, 10, 1, 7, 9. and 11.

Interpretation with Reference to Morris

Factor loadings of 0.32 or above and -0.32 or below were taken into account in the interpretation of a factor loading. The coefficient, 0.32 was arbitrarily selected as it essentially included those variables on each factor that were included in Morris' study. A factor loading in the neighbourhood of 0.00 indicates that the content of the variable has little or nothing in common with the factor. Morris used factor loadings of 0.25 or above and -0.25 or below in accepting variables on his five factors. As noted, this study was based on three oblique factors, whereas, Morris' was based on five orthogonal factors. The oblique quasi-procrustean rotation was expected to yield higher factor coefficients as a factor weight of 50 was used to obtain a maximum mean difference.

For ease of interpretation Table IX compares dimension I, Dependence, of the present study with Morris' Factor E, self-indulgence, where the orientation is to self, and Factor D, receptivity and sympathetic concern, where the orientation is to other than self. Morris' factor loadings are taken from the United States rotation (Morris, 1956,

p. 32) and represent coefficients on the five factors. Direct comparison of the numerical values of coefficients might be misleading since it has not been established what the quantitative relationships are between Morris' five factor loadings and the present three dimension coordinates. The comparison only indicates relative loadings on a factor. If a variable has a high loading on a factor using the oblique rotation and a high loading on a factor using a centroid solution, one may conclude that the two solutions match for that variable on that factor.

TABLE IX

COMPARISON OF OBLIQUE QUASI-PROCRUSTEAN
SOLUTION AND CENTROID SOLUTION
FOR FACTOR I--DEPENDENCE

VARIABLE	FACTOR LOADINGS on Three-dimen- sional Oblique Quasi-Procrustean Solution	FACTOR LOADINGS on Five-dimen- sional Centroid Solution	
		Orientation to Self	Orientation to other than self
		Factor E	Factor D
8 (wholesome enjoyment)	.58	.44	
4 (festivity and solitude)	.47	.38	
10 (stoic self- control)	-.46		-.25
9 (receptivity)	.43		.47
6 (master changing conditions)	-.33	.06	.02

With the exception of Variable 6 (master changing conditions), the highest loadings evident on the Dependence dimension, Variable 8 (wholesome enjoyment), Variable 4 (festivity and solitude), Variable 10 (stoic self-control), and Variable 9 (receptivity), also appear in Morris' study. Variable 8 (wholesome enjoyment), had the highest loading (0.44) on Factor E, self-indulgence, of Morris' study. Variable 4 (festivity and solitude), Variable 10 (stoic self-control), and Variable 9 (receptivity), have loadings on the Dependence dimension and correspond to those on Morris' Factor E, self-indulgence, and Factor D, receptivity and sympathetic concern. Variable 6 (master changing conditions) has a factor loading of 0.33 on the Dependence dimension and 0.06 and 0.02 on Factor E and Factor D, respectively. The factor loading of Variable 6 is above the critical value accepted (0.32) but is a marginal variable on dimension I, Dependence. This variable has little in common on Factor E or D. One may regard the correspondence between the two solutions as good because four variables (8, 4, 10, and 9) load on the same dimension in both studies, but one variable (6) was not identified in the centroid solution but appeared marginally in the oblique rotation.

Table X compares dimension II, Dominance, with Factor B, enjoyment in action, of Morris' study.

The highest factor loading in both studies is Variable 12 (adventuresome). Variable 6 (master changing conditions) is also emphasized in both studies. The

TABLE X

COMPARISON OF THE OBLIQUE QUASI-PROCRUSTEAN
SOLUTION AND CENTROID SOLUTION FOR
FACTOR II--DOMINANCE

VARIABLE	FACTOR LOADINGS on Three-dimen- sional Oblique Quasi-Procrustean Solution	FACTOR LOADINGS on Five-dimen- sional Centroid Solution	
		Orientation to Self	Orientation to other than self
		Factor B ₁	Factor B ₂
12 (adventure- some)	.77	.58	
7 (Integrate action enjoyment and contemplation)	-.44	-.19	
1 (Preserve the best that man has attained)	.42	.03	
6 (master changing conditions)	.41	.30	
5 (enjoy life through group participation)	.24		.34
2 (independence of persons and things)	.13		-.28

quasi-procrustean solution identifies Variable 1 (preserve the best that man has attained) on dimension II, Dominance, (.42) but higher on dimension III, Detachment (.47). In the centroid solution, Variable 1 was identified only with Factor A, social restraint and self-control. It appears that Variable 1 has more in common with the dimension of Detachment. One may regard the correspondence between the two solutions as adequate because three variables (1, 12, and 6) load on the same dimensions in both studies but one variable (1) was common to dimensions II and III. Variables 2, 5, and 7 will be dealt with later as they obtained loadings on more than two factors in Morris' study.

Table XI compares dimension III, Detachment, with Morris' Factor C, withdrawal and self-sufficiency, and Factor A, social restraint and self-control.

Variable 2 (independence of person and things), Variable 10 (stoic self-control), Variable 1 (preserve the best that man has attained), Variable 9 (receptivity), and Variable 11 (meditate on inner life), are identified in both the oblique quasi-procrustean solution and the centroid solution. The correspondence between the studies is very good as five variables load on the same dimensions in both studies and one variable (7) may be considered a common dimension.

Certain variables do not agree between the two studies, namely, Variable 3 (concern for others), Variable 5 (enjoy life through group participation), Variable 13 (obey

TABLE XI

COMPARISON OF OBLIQUE QUASI-PROCRUSTEAN
SOLUTION AND CENTROID SOLUTION
FOR FACTOR III--DETACHMENT

VARIABLE	FACTOR LOADINGS on Three-dimen- sional Oblique Quasi-Procrustean Solution	FACTOR LOADINGS on Five-dimen- sional Centroid Solution	
		Orientation to Self	Orientation to other than self
		Factor C	Factor A
2 (independence of persons)	.76	.50	
10 (stoic self- control)	.62		.41
1 (preserve the best that man has attained)	.47		.51
7 (integrate action enjoyment and contemplation)	-.44	-.07	.02
9 (receptivity)	.36	.26	
11 (meditate on inner life)	.32	.54	

the cosmic purposes), and Variable 7 (integrate action, enjoyment, and contemplation). Possible reasons are suggested as to why there is not agreement between the two studies in the above variables.

Variable 3 (concern for others). The oblique quasi-procrustean solution points out that Variable 3 has attributes common to all dimensions. Variable 3 is suppressed with small factor loadings of 0.04, 0.22, and 0.02 on the dimensions of Dominance, Dependence, and Detachment, respectively. In the centroid solution, Variable 3 has high loadings on those factors that represent orientation to other than self, namely Factor D, receptivity and sympathetic concern, Factor E, enjoyment in action, and Factor A, social restraint and self-control. Variable 3 appears to be a "general" variable as it did not discriminate among the dimensions of Dependence, Dominance, and Detachment.

Variable 5 (enjoy life through group participation). The oblique quasi-procrustean solution points out that Variable 5 has attributes common to all dimensions. This solution yields factor coefficients of 0.22, 0.23, and 0.05 on the dimensions of Dependence, Dominance, and Detachment, respectively. In the centroid solution, Variable 5 received high factor loadings on Factor C, withdrawal and self-sufficiency and Factor B, enjoyment in action. Like Variable 3, this variable also appears to be a "general" variable and did not discriminate among the three dimensions of Dependence,

Dominance, and Detachment using the oblique rotation.

Variable 13 (obey the cosmic purposes). In the oblique quasi-procrustean solution, Variable 13 was suppressed in relation to all the three dimensions. Factor loadings of 0.06, 0.05, and 0.19 were obtained for the dimensions of Dependence, Dominance, and Detachment. In the centroid solution, Variable 13 received high loadings on Factor D, receptivity and sympathetic concern, in the United States rotation and fairly high loadings on Factor A, social restraint and self-control, and Factor B, enjoyment in action, on the Chinese rotation (Morris, 1956, Table 6, p. 35). As in Variables 3 and 5, Variable 13 is a "general" variable as it did not discriminate among the three dimensions of Dependence, Dominance, and Detachment, and Detachment, using the oblique rotation.

Variable 7 (integrate action, enjoyment, and contemplation). Variable 7 also appears to be a "general" variable. In the oblique quasi-procrustean rotation, high loadings were obtained on the Dominance dimension and the Detachment dimension. In the centroid rotation, Variable 7 has low factor loadings on all five dimensions. This suggests that Variable 7 is a "general" variable as it did not discriminate among the dimensions.

To summarize the results of the findings to this point, it appears that the intercorrelations among the "Ways To Live" variables can be factor analyzed directly to obtain

three value dimensions, Dependence, Dominance, and Detachment. The three dimensions isolated, using the oblique quasi-procrustean rotation, exhibit considerable agreement as far as interpretation is concerned, with the three dimensions used by Morris. For dimension I, Dependence, four variables (8, 4, 10, 9) load on the same dimensions in both studies. One variable (6) was not identified in the centroid rotation but appeared marginally in the oblique quasi-procrustean rotation. For dimension II, Dominance, three variable (1, 12, 6) exhibit agreement with the three dimensions used by Morris. Two variables (2, and 5) may be considered as "general" variables. For dimension III, Detachment, five variables (2, 10, 1, 9, and 11) exhibit agreement with the three dimensions used by Morris and one variable (7) may be considered as a "general" variable. The results appear sufficiently close to the three dimensions, Dependence, Dominance, and Detachment, used by Morris, to regard them as being essentially the same.

II. CORRELATIONAL ANALYSIS

Determining Factor Scores

The preceding section in this chapter described the results of the factor analysis of the "Ways To Live" data. The final solution obtained was the primary-factor pattern matrix shown in Table VII. After the linear description of the variables had been obtained in terms of the factors, it was necessary to identify the subjects' profiles

in terms of the variables. These were obtained through the observed variables. The factor model in matrix form (p. 27) was:

$$Z = AF$$

This solution is in terms of n common factors so that A is a square nonsingular matrix which has an inverse. The required factor scores are obtained (Harman, 1968, p. 165) as follows:

$$F = A^{-1} Z$$

where

F = matrix of factor scores to the order of (rxN)

A^{-1} = the inverse of a matrix of factor loadings of order $(n \times r)$

Z = standard score matrix of order $(n \times N)$.

The factor scores were calculated from this equation. It was first necessary to convert the primary-factor pattern matrix to a primary-factor structure matrix as correlated factors are employed. Table XII presents the primary-factor structure matrix.

Table XIII shows the factor scores for each of the 78 subjects. For convenience, scores were arbitrarily calculated with a mean of 50 and a standard deviation of 10.

Column I represents the dimension of Dependence.

Column II represents the dimension of Dominance.

Column III represents the dimension of Detachment.

The higher the factor score, the more predominant that factor is in relation to the other two factors in characterizing an individual.

TABLE XII

PRIMARY-FACTOR STRUCTURE MATRIX

	I	II	III
1	-.00	.04	.23
2	.21	-.19	.66
3	.03	-.22	.10
4	.32	.13	-.03
5	.13	.19	-.04
6	-.32	-.39	-.10
7	.07	-.29	-.17
8	.42	.12	.00
9	.65	-.40	.63
10	-.14	-.19	.41
11	.52	-.42	.55
12	.08	.68	-.21
13	.05	-.12	.19

TABLE XIII

FACTOR SCORE AND INQUIRY SCORES
FOR 78 SUBJECTS

Subject I.D.	Factor Scores (a)*			Inquiry Scores (b)		
	I	II	III	1	2	3
0103	478	631	377	22	36	32
0213	484	604	481	32	34	24
0303	339	489	323	18	38	34
0403	528	571	501	36	38	16
0503	428	480	562	18	38	34
0604	153	519	470	22	42	26
0713	521	493	600	16	40	34
0803	489	461	556	32	26	32
0913	402	436	462	16	34	40
1004	620	365	630	10	40	40
1103	563	306	682	22	44	24
1204	596	443	636	26	28	36
1303	439	589	678	18	42	30
1403	546	434	490	14	40	36
1513	592	311	532	26	30	34
1613	530	433	524	28	26	36
1713	332	568	393	12	38	40
1803	355	408	484	14	34	42
1903	306	695	300	20	36	34

* score $\times 10^{-1}$

TABLE XIII (continued)

Subject I.D.	Factor Scores (a) *			Inquiry Scores (b)		
	I	II	III	1	2	3
2003	395	433	545	26	34	30
2103	513	476	476	26	40	24
2203	405	571	603	28	30	32
2303	375	692	435	20	42	28
2403	532	378	522	26	30	34
2503	601	427	550	14	42	34
2613	555	396	498	12	40	38
2713	557	377	606	24	40	26
2804	424	558	334	26	36	28
2913	403	393	408	26	36	28
3003	513	491	543	24	30	36
3103	613	549	579	24	32	34
3203	540	589	512	20	36	34
3313	539	631	337	10	44	36
3413	565	374	556	26	36	28
3513	565	489	492	14	32	44
3603	770	468	633	12	44	34
3703	521	549	563	32	28	30
3813	512	576	396	32	30	28
3903	558	499	645	16	40	34
4003	574	424	639	18	36	36
4104	393	579	477	24	38	28

* score $\times 10^{-1}$

TABLE XIII (continued)

Subject I.D.	Factor Scores (a) *			Inquiry Scores (b)		
	I	II	III	1	2	3
4203	393	377	484	26	38	26
4303	388	635	398	28	38	24
4413	484	564	451	20	30	40
4513	393	594	273	30	30	30
4613	511	465	585	28	34	28
4703	712	508	535	30	28	32
4803	570	480	480	20	32	38
4903	443	561	420	22	30	38
5003	393	590	338	24	40	26
5103	528	458	646	24	32	34
5214	594	407	541	30	38	22
5313	616	512	572	30	30	30
5413	667	388	381	20	34	36
5503	502	490	543	12	42	36
5613	500	583	482	12	44	34
5703	518	720	580	26	36	28
5804	473	629	378	12	42	36
5903	651	247	717	22	38	30
6013	620	363	596	32	24	34
6113	357	651	393	32	34	24
6213	574	542	445	16	40	34
6303	454	543	376	28	22	40

* score $\times 10^{-1}$

TABLE XIII (continued)

Subject I.D.	Factor Scores (a) *			Inquiry Scores (b)		
	I	II	III	1	2	3
6403	470	414	536	14	34	42
6503	494	527	466	14	38	38
6603	453	678	394	20	38	32
6703	442	451	642	26	36	28
6813	520	570	334	16	40	34
6913	643	562	535	22	34	34
7013	602	464	533	26	38	26
7103	425	377	397	26	34	30
7203	556	541	507	14	36	40
7314	470	467	524	12	32	46
7403	555	532	416	28	38	24
7513	429	270	475	20	30	40
7613	558	608	507	22	34	34
7703	503	563	394	24	36	30
7804	364	523	395	16	42	32

* Score $\times 10^{-1}$

Determining the Inquiry Preference Scores

At this point a review of the problem under investigation is in order. The investigator sought a relationship between the dimensions of value of pre-service secondary school social studies teachers and their indicated preference for the form of inquiry in dealing with social issues.

The inquiry preference scores for each subject were obtained by summing the weights given on the inquiry instrument for each of the three forms of inquiry, namely, Designative, Prescriptive, and Appraisive. A weight of 5 was given to the form of inquiry the subject preferred the most. A weight of 3 was given to the form of inquiry the subject preferred quite a lot. A weight of 1 was given to the form of inquiry the subject preferred slightly. This weighting corresponds to the weights the subjects used when giving their preferred form of inquiry. A maximum of 50 and a minimum of 10 was possible for each subject. The three inquiry scores added up to 90 for each subject.

The three scores are ipsative, that is, the test measures only the relative strength of the forms of inquiry. Ipsative units are relative to other measures on the person himself, such units presupposes a continuum and are applicable where various responses can be put in numerical order or rank on a continuum. Any score matrix, which has the property that the sum of the scores over the attribute for each of the entities is a constant, is an ipsative measurement, that is, each score for an individual is dependent on his scores on the other variables (Clemens, 1956, p. 13).

It must be emphasized that scores are relative scores. A high score on one form of inquiry can only be obtained by reducing correspondingly the scores on one or both of the other forms of inquiry. Introspective data can only be expressed in ipsative units (Cattell, 1952, p. 105). Therefore, it is necessary to bear in mind that the scores reveal only the relative importance of the three forms of inquiry for a given individual, not the total amount of inquiry preference possessed by the individual. It is quite possible for a generally apathetic person to be less intense in his inquiry preferences and score higher on one form of inquiry than the individual whose inquiry preferences are all high.

Table XIIIb presents the inquiry scores for each subject on the three forms of inquiry. Column 1 represents Designative inquiry, column 2 represents Prescriptive inquiry, and column 3 represents Appraisive inquiry. The higher the inquiry preference score, the more predominant the subject's inquiry preference is on that form of inquiry in relation to the other forms of inquiry.

Table XIV presents the means and standard deviation of the scores for the form of inquiry preference for each subject.

The pairwise comparisons of the means yielded significant differences at the $p < 0.01$ level when the Sheffe procedure was applied. The Sheffe procedure measures the differences between all possible pairs of means (Winer, 1962,

TABLE XIV

MEANS AND STANDARD DEVIATION OF
THE INQUIRY SCORES

	1	2	3
MEANS	21.3	35.6	32.6
STANDARD DEVIATIONS	6.4	5.0	5.6

p. 88). It is not unexpected that the means differ since the subject preference for the form of inquiry was "forced" choice. When two choices had been made, the third choice was fixed. The result is that inquiry preference 1, Designative, has a much lower mean than inquiry preference 2, Prescriptive, and inquiry preference 3, Appraisive.

The intercorrelations of inquiry forms are presented in Table XV.

TABLE XV

INTERCORRELATION OF PREFERENCE FOR INQUIRY

	1	2	3
1			
2	-0.54 [*]		
3	-0.66 [*]	-0.23 ^{**}	

^{*}
p < 0.01

^{**}
p < 0.05

Correlations are significant at $p < 0.05$ for preference for

inquiry forms 1 and 2 and 1 and 3 and $p < 0.01$ for inquiry forms 2 and 3. The correlations are negative because of the ipsative nature of the scale. Because the three scores sum to be the same number for each individual, there is a high correlation between the preferences for the forms of inquiry.

Correlations of Values with Inquiry

The correlations between inquiry preferences and value dimensions are shown in Table XVI. It is evident from the Table that all coefficient of correlations are not significantly different from zero. This indicates that no consistent relationship was found between the preference for the form of inquiry and the value dimensions held dominant by the subjects of this study. That there is zero correlation

TABLE XVI

CORRELATIONS OF VALUE DIMENSIONS WITH INQUIRY PREFERENCES

		1	2	3
Values		Designative Inquiry	Prescriptive Inquiry	Appraisive Inquiry
1	Dependence	-.01	-.09	.09
2	Dominance	.03	.12	-.15
3	Detachment	.01	-.04	.02

not unexpected because of the nature of the inquiry preference scores and the type of rotation used in the value

dimension. The coefficients for the forms of inquiry are negative and correlate among themselves (Table XV, p. 64). This is probably due to the ipsative characteristics of the scores and the interrelated nature of the inquiry preferences themselves. Also there is high correlation among the value dimensions as indicated in Table XVII. (It should be noted that coefficients on the intercorrelations of the value dimensions in Table XVIII are slightly higher than the coefficients on Table VIII, page 46. This is possibly due to rounding error as a result of changing the primary-factor pattern to a primary-factor structure). The high correlation was expected as an oblique rotation was used. Since the forms of inquiry correlate among themselves and the value dimensions correlate among themselves, it is not unexpected that the correlation between the value dimensions and inquiry forms would be similar for all three value dimensions.

On the basis of the results, null hypothesis 1--for those pre-service secondary school social studies teachers whose value dimension is predominantly detached,

TABLE XVII

INTERCORRELATIONS OF VALUE DIMENSIONS

Dimensions	I	II	III
I			
II	-.32 [*]		
III	.55 [*]	-.51 [*]	

*
p < 0.05

there will be no correlation between indicated preference for designative inquiry and indicated preference for appraisive inquiry and indicated preference for prescriptive inquiry--was not rejected. No significant correlation ($r = 0.01$) was found between the dimension of Detachment and the Designative form of inquiry. As there was zero correlation, the preferred form of inquiry could be either Designative, Prescriptive, or Appraisive.

Null hypothesis 2--for those pre-service secondary school social studies teachers whose value dimension is predominantly dominant there will be no correlation between indicated preference for prescriptive inquiry and indicated preference for designative inquiry and indicated preference for appraisive inquiry--was not rejected. No significant correlation ($r = 0.12$) was found between the dimension of Dominance and the Prescriptive form of inquiry. As the correlation was near zero, the preferred form of inquiry could be either Designative, Prescriptive, or Appraisive.

Null hypothesis 3--for those pre-service secondary school social studies teachers whose value dimension is predominantly dependent, there will be no correlation between indicated preference for appraisive inquiry and indicated preference for designative inquiry and indicated preference for prescriptive inquiry--was not rejected. No significant correlation ($r = 0.09$) was found between the dimension of Dependence and the Appraisive form of inquiry. As there was zero correlation, the preferred form of inquiry could be

either Designative, Prescriptive, or Appraisive.

Interpretation

It was hypothesized that there would be a significant relationship between the value dimensions one holds and the form of inquiry one prefers. As noted, the intercorrelations of the value dimensions are high (Table XVII) due to the oblique rotation of the factors. The intercorrelations of the inquiry forms are also high (Table XV) due to the ipsative scores and the interrelated nature of the inquiry preferences. Since the values correlate among themselves and the forms of inquiry correlate among themselves, it is not unexpected that the correlations between the value dimensions and inquiry forms are similar. The zero correlations may be attributed to a number of reasons.

The method used for scoring the inquiry instrument was at least partially responsible for the high correlation among the inquiry forms. By changing the scoring so that it is not ipsative, that is, making the scoring open-ended so that the units would be normative, a lower correlation among the inquiry forms may result. Greater independence of the inquiry forms may permit preferences to emerge.

Another possibility is that the variables used in this study, values and inquiry, are more complex than the instruments were capable of measuring. Tate, (1955, p. 129) in maintaining that this is often true of social research, states that the possibility of exerting sufficient controls

to permit viable experimental study of a relationship between the general tendencies of the variables observed is remote. Some confounding variables that are difficult to control are one's emotions, needs, wants, motives and attitudes. The instructions on the "Ways To Live" instrument asked the subjects to respond according to their conceived values. The inquiry instrument asked the subjects to respond to the form of inquiry they preferred. It is difficult to determine what part the confounding variables played. The possibility remains that the measuring instruments may not have adequately reflected the conceived values or the inquiry preferences of the subjects. This possibility is reflected in the validity for the two instruments used. While the reliability for the "Ways To Live" instrument was between 0.78 and 0.85, and for the inquiry instrument between 0.69 and 0.82, the validity of each instrument was not ascertained.

As stated in Chapter 2, Morris suggested that the person whose dominant value dimension was detached would prefer designative inquiry. The person whose dominant value dimension was dominant would prefer prescriptive inquiry; and the person whose dominant value dimension was dependent would prefer appraisive inquiry. It may be that this relationship is not as straightforward as Morris suggests. Factor analysis of the "Ways To Live" may be used to place a subject in his dominant value dimension at a particular point in time. However, the factor scores indicate that while a subject may have been predominant on one value dimension, the

other value dimensions may also be in evidence. This represents confirmation of the Morris' theory that all three value dimensions are present in a person, but that one dimension is predominant. The finding that a subject exhibits all three value dimensions, albeit in different proportions, indicates that it may be difficult to say with confidence that a subject is dominant in only one value dimension.

The notion that a subject must be dominant in one or the other value dimension may be open to question. Confounding variables such as biological, psychological, and social influences may make values difficult to measure. In addition, characterizing a subject according to his preference for a form of inquiry becomes equally complex because of overlapping preferences for a particular situation. It may be impossible to separate and identify inquiry preferences in an individual. Consequently, establishing a relationship between the subject's value dimension and his preference for a form of inquiry becomes very complex. The theoretical model may have given the impression that the categories were simple and well organized. The results of the data indicate that these relations may be much more complex than anticipated.

One aspect that emerged indicates that the displays chosen, portraying social issues, "begs" the subject to act manipulatively or to act consummatorily toward the display. There was a heavy emphasis indicated (by the subjects) on prescriptive and appraisive inquiry. The results showed

that 57.7% of the subjects preferred prescriptive inquiry the most, 30% preferred appraisive inquiry the most, and 5.1% preferred prescriptive and appraisive inquiry in equal amounts. Only 2.6% of the subjects preferred designative inquiry the most. The remainder, 4.6%, did not show a preference. Possible reasons are suggested for the emphasis on prescriptive and appraisive inquiry. It is possible that the subjects' responses were in terms of what they felt were the expectation of the investigator, school, or society. It is also possible that the subjects' responses indicate a trait common to some young adults who question values and who have solutions for issues facing society. By restricting the displays to social issues, the subjects' actual preferences were limited.

III IMPLICATIONS FOR EDUCATION

The findings and interpretations of the study suggest implications for teaching and learning situations. This section will not seek implications regarding the relationship between values and inquiry, since near zero correlation was found. However, it will view the implications of values to education, and implications of inquiry to education.

Values

The findings confirm that interpretable value dimensions can be determined for individuals. Although each

individual possesses all value dimensions, one dimension may be more salient than the others. One of the aims of education is to make the individual aware and sensitive to his inner reactions and feelings, to the reactions and feelings of others, and to the realities of the objective world (Rogers, 1964, p. 165). The student in his interaction with the teacher should be allowed to explore his own value dimensions.

However, Rogers (1964, p. 167) maintains that a large number of conceived values in an individual are learned from others and are adopted as his own, even though they may be widely discrepant from what he is experiencing. Because these concepts are not based on his own valuing, they tend to be fixed and rigid, rather than fluid and changing. This discrepancy between what the individual is actually experiencing and what he has learned is part of the estrangement of modern man from himself. The focus of evaluation must be within a person so that his own experience provides the value information. A person's valuing should be based upon reactions within himself, not what he has been told by others.

Because an individual can act according to his conceived values, errors in valuing may be foreseen and adjusted. Rogers (1964, p. 175) has found that if people are encouraged to look at their conceived values openly, common value directions will emerge as the values will be directed at the survival and evolution of mankind. If

valuing is understood, individuals should develop more freely. Therefore, social studies teachers should strive to obtain an open climate in the classroom so that examination of values is permitted. The teacher's control tactics must be such that the student may develop "positive preferential behavior to the extent that it continues to give satisfaction to its perceivers" (Morris, 1964, p. 77). If such positive preferential behavior is developed, an individual's sensitivity to himself and others may be heightened.

Displays serve as useful springboards. The social studies program invites inquiry into individual and social values so the "Ways To Live" instrument could be a useful display for a social studies teacher to allow students to explore the various value dimensions. Aspects of the good life could be examined both from the individual and social point of view. A student will act more intensely towards certain Ways, according to his predominant value dimensions. Such examinations will make the student more aware of valuing.

Inquiry

The findings in this study imply that the process of inquiry is of a complex nature. Morris states that inquiry is a reflective process involving signs directed at problem solving. "Reflective" is probably the key word in his definition. Reflection suggests that the inquiry processes require structure permitting mobility. The inquiry

preferences should be free to move from one idea to another, and arrange the ideas into new combinations. The mind is able to symbolize many strands of thought simultaneously. The teacher should be aware that a reflective process exists and should expect students to "muddle through." O'Bryan and MacDonald (1967, p. 212) suggest that such structure arises out of an individual's flexibility in changing criteria, either because he notices some property which he previously failed to take into account, or because new elements are added to his environment. The teacher must appreciate this when students are asked to inquire.

Since the aim of the social studies program is to allow students to inquire into his own values the teacher should use approaches which will facilitate such inquiry. In order for a student to understand himself he must first be given the chance to explore various issues. In an open climate situation the student should have a chance to examine various forms of inquiry. However, this same open climate situation must allow and recognize each student's right to pursue his inquiry preference. The formulation of a student's value will be enhanced if the student is allowed to inquire according to his preference.

The results of the study also indicate that when dealing with social issues, a teacher may expect the student will want to find a prescription for the social problems. It implies that the displays will not provoke sufficient designative inquiry. In order to deal with social issues

more comprehensively, displays invoking designative inquiry in social issues will have to be provided.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

I. SUMMARY

The purpose of this study was an exploratory investigation into the relationship between value dimensions and inquiry preferences. Morris (1964) has theorized that there is a relationship. This study grew out of interest in the transaction between students and the instrumental content embedded in the display.

Charles Morris' theory of semiosis seems particularly relevant in the area of transaction. He sees signs in terms of dispositions to act. Signs are identified within goal seeking behavior. A sign sets up in an interpreter a disposition to act in a certain way to a certain kind of object under certain conditions.

Signs are tridimensional--designative, appraisive, and prescriptive. If an impulse is given, the resulting action is perceptual for designative signs, consummatory for appraisive signs and manipulatory for prescriptive signs.

Values are the properties of objects or situations relative to the preferential behavior. There are three dimensions of value which are related to significations. In the perceptual stage of the act the detached value dimension is expected to be predominant; in the consummatory stage of

the act the dependent value dimension is expected to be predominant; and in the manipulatory stage of the act, the dominant value dimension is expected to be predominant.

Morris sees inquiry as a reflective process involving signs and directed at solving a problem. Inquiry is related to the stages of action, signs, and value dimensions. Designative inquiry should be preferred over appraisive and prescriptive inquiry for those holding a value dimension of detachment. Appraisive inquiry should be preferred over designative and prescriptive inquiry for those holding a value dimension of dependence. Prescriptive inquiry should be preferred over designative inquiry and appraisive inquiry for those holding a value dimension of dominance.

Seventy-eight undergraduate students registered in social studies Curriculum and Instruction 266 at the University of Alberta were used as subjects. The Inquiry instrument was administered to determine the inquiry preference held by each subject. The "Ways To Live" instrument was used to determine the value dimension held by each subject.

The "Ways To Live" data was factor analyzed using the maximum likelihood solution and the oblique quasi-procrustean rotation. It was found that three value dimensions, Dominance, Dependence, and Detachment, could be obtained directly. These dimensions appear to be sufficiently close to the three dimensions used by Morris to regard them as being essentially the same. The results show that each subject indicates a predominant value in one of the three

dimensions with lesser emphasis in the other two dimensions. The inquiry instrument indicates that each subject may be characterized as preferring one of the three forms on inquiry, Prescriptive, Appraisive, or Designative, with lesser emphasis on the other two forms of inquiry. Essentially zero correlation resulted when the value dimensions were correlated with the forms of inquiry. Possible reasons for the lack of correlations are suggested:

- (1) Because high intercorrelations among the value factors resulted due to oblique rotations used, and negative correlations resulted among the forms of inquiry due to the ipsative nature of the scoring, the correlation between values and factors and inquiry preferences will be near zero.

- (2) Confounding variables may have influenced both the Inquiry instrument and the "Ways To Live" instrument.

- (3) The inquiry process is a very complex process and difficult to measure.

- (4) The displays used were based on social issues. As such, they demanded prescriptive or appraisive inquiry in preference to designative inquiry.

The findings of this study suggest the following implications for education.

- (1) Value dimensions can be determined by factor analytic procedure for a student. Teachers should allow students to explore their values to allow individuals to develop freely.

(2) The "Ways To Live" may be used as a display to explore values.

(3) The inquiry process is complex. The reflective aspect of inquiry should permit students to "muddle through."

(4) In order to facilitate the formulation of values, a student should be allowed to use the form of inquiry he prefers.

(5) Displays dealing with social issues promote prescriptive and appraisive inquiry. Teachers will have to provide for designative inquiry in order to give a comprehensive approach to social issues.

II. RECOMMENDATIONS

As the present study was of an exploratory nature into the area of values and inquiry, numerous possibilities exist for further study.

(1) Inquiry, like value, is a complex and difficult concept. A more sophisticated instrument will have to be designed to determine inquiry preferences. It should be possible to develop such an instrument using Morris' "Ways To Live" instrument as a model, so that the forms of inquiry may be factor analyzed. This would determine whether there are three basic forms of inquiry as has been suggested.

(2) This study involved finding inquiry preference forms in the area of social issues. The signs interpreted by the individuals resulted in prescriptive and appraisive inquiry.

Further investigation should be carried out to confirm that social issues displays do in fact result in prescriptive or appraisive inquiry.

(3) The present study used black and white slides as the media for the interaction between the student and the display. Other types of media should be investigated.

(4) When recommendations 1, 2, and 3 have been accomplished, further investigation into Morris' theory that a relationship exists between values and inquiry should be reconsidered.

(5) The present study relied on a limited population of pre-service secondary social studies teachers registered in a single course in a single school of education. It is suggested that a wider sampling be used to increase the level of generalizability.

(6) This study showed that value dimensions could be factor analyzed using the "Ways To Live" instrument and the subjects' value dimensions could be determined. Further investigation should pursue the following questions:

- a) Will a teacher who is very predominant in a certain value dimension impose his value on the student?
- b) Will more effective learning occur if teachers and students are matched according to their value dimensions?
- c) What form of control will be most favourable in order for a student to develop his own values?

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APPENDIX A
WAYS TO LIVE

APPENDIX A

WAYS TO LIVE

Instructions: Below are described thirteen ways to live which various persons at various times have advocated and followed.

Indicate by numbers, which you are to write on the answer sheet, how much you yourself like or dislike each of them. Do them in order. Do not read ahead.

Remember that it is not a question of what kind of life you now lead, or the kind of life you think it prudent to live in our society, or the kind of life you think good for other persons, but simply the kind of life you personally would like to live.

Use the following scale of numbers, placing one of them on the answer sheet provided.

7. I like it very much.
6. I like it quite a lot.
5. I like it slightly.
4. I am indifferent to it.
3. I dislike it slightly.
2. I dislike it quite a lot.
1. I dislike it very much.

Way 1. In this 'design for living' the individual actively participates in the social life of his community, not to change it primarily, but to understand, appreciate, and preserve the best that man has attained. Excessive desires should be avoided and moderation sought. One wants the good things of life but in an orderly way. Life is to have clarity, balance, refinement, control. Vulgarity, great enthusiasm, irrational behavior, impatience, indulgence are to be avoided. Friendship is to be esteemed but not easy intimacy with many people. Life is to have discipline, intelligibility, good manners, predictability. Social changes are to be made slowly and carefully, so that what has been achieved in human culture is not lost. The individual should be active physically and socially, but not in a hectic or radical way. Restraint and intelligence should give order to an active life.

Way 2. The individual should for the most part 'go it alone,' assuring himself of privacy in living quarters, having much time to himself, attempting to control his own life. One

should stress self-sufficiency, reflection and meditation, knowledge of himself. The direction of interest should be away from the physical manipulation of objects or attempts at control of the physical environment. One should aim to simplify one's external life, to moderate those desires whose satisfaction is dependent upon physical and social forces outside of oneself, and to concentrate attention upon the refinement, clarification, and self-direction of one's self. Not much can be done or is to be gained by 'living outwardly.' One must avoid dependence upon persons or things; the center of life should be found within oneself.

Way 3. This way of life makes central the sympathetic concern for other persons. Affection should be the main thing in life, affection that is free from all traces of the imposition of oneself upon others or of using others for one's own purposes. Greed in possessions, emphasis on sexual passion, the search for power over persons and things, excessive emphasis upon intellect, and undue concern for oneself are to be avoided. For these things hinder the sympathetic love among persons which alone gives significance to life. If we are aggressive we block our receptivity to the personal forces upon which we are dependent for genuine personal growth. One should accordingly purify oneself, restrain one's self-assertiveness, and become receptive, appreciative, and helpful with respect to other persons.

Way 4. Life is something to be enjoyed--sensuously enjoyed, enjoyed with relish and abandonment. The aim of life should not be to control the course of the world or society or the lives of others, but to be open and receptive to things and persons, and to delight in them. Life is more a festival than a workshop or a school for moral discipline. To let oneself go, to let things and persons affect oneself, is more important than to do--or to do good. Such enjoyment, however, requires that one be self-centered enough to be keenly aware of what is happening and free for new happenings. So one should avoid entanglements, should not be too dependent on particular people or things, should not be self-sacrificing; one should be alone a lot, should have time for meditation and awareness of oneself. Solitude and sociality together are both necessary in the good life.

Way 5. A person should not hold on to himself, withdraw from people, keep aloof and self-centered. Rather merge oneself with a social group, enjoy cooperation and companionship, join with others in resolute activity for the realization of common goals. Persons are social and persons are active; life should merge energetic group activity and cooperative group enjoyment. Meditation, restraint, concern for one's self-sufficiency, abstract intellectuality, solitude, stress on one's possessions all cut the roots which bind

persons together. One should live outwardly with gusto, enjoying the good things of life, working with others to secure the things which make possible a pleasant and energetic social life. Those who oppose this ideal are not to be dealt with too tenderly. Life can't be too fastidious.

Way 6. Life continually tends to stagnate, to become 'comfortable,' to become "sicklied o'er with the pale cast of thought." Against these tendencies, a person must stress the need of constant activity--physical action, adventure, the realistic solution of specific problems as they appear, the improvement of techniques for controlling the world and society. Man's future depends primarily on what he does, not on what he feels or on his speculations. New problems constantly arise and always will arise. Improvements must always be made if man is to progress. We can't just follow the past or dream of what the future might be. We have to work resolutely and continually if control is to be gained over the forces which threaten us. Man should rely on technical advances made possible by scientific knowledge. He should find his goal in the solution of his problems. The good is the enemy of the better.

Way 7. We should at various times and in various ways accept something from all other paths of life, but give no one our exclusive allegiance. At one moment one of them is the more appropriate; at another moment another is the most appropriate. Life should contain enjoyment and action and contemplation in about equal amounts. When either is carried to extremes we lose something important for our life. So we accept the tension which this diversity produces, find a place for detachment in the midst of enjoyment and activity. The goal of life is found in the dynamic integration of enjoyment, action, and contemplation, and so in the dynamic interaction of the various paths of life. One should use all of them in building a life, and no one alone.

Way 8. Enjoyment should be the keynote of life. Not the hectic search for intense and exciting pleasures, but the enjoyment of the simple and easily obtainable pleasures: the pleasures of just existing, of savory food, of comfortable surroundings, of talking with friends, of rest and relaxation. A home that is warm and comfortable, chairs and a bed that are soft, a kitchen well stocked with food, a door open to the entrance of friends--this is the place to live. Body at ease, relaxed, calm in its movements, not hurried, breath slow, willing to nod and to rest, grateful to the world that is its food--so should the body be.

Driving ambition and the fanaticism of ascetic ideals are the signs of discontented people who have lost the capacity to float in the stream of simple, carefree, wholesome enjoyment.

Way 9. Receptivity should be the keynote of life. The good things of life come of their own accord, and come unsought. They cannot be found by resolute action. They cannot be found in the indulgence of the sensuous desires of the body. They cannot be gathered by participation in the turmoil of social life. They cannot be given to others by attempts to be helpful. They cannot be garnered by hard thinking. Rather do they come unsought when the bars of the self are down. When the self has ceased to make demands and waits in quiet receptivity, it becomes open to the powers which nourish it and work through it; and sustained by these powers it knows joy and peace. To sit alone under the trees and the sky, open to nature's voices, calm and receptive, then can the wisdom from without come within.

Way 10. Self-control should be the keynote of life. Not the easy self-control which retreats from the world, but the vigilant, stern, manly control of a self which lives in the world, and knows the strength of the world and the limits of human power. The good life is rationally directed and holds firm to high ideals. It is not bent by the seductive voices of comfort and desire. It does not expect social utopias. It is distrustful of final victories. Too much cannot be expected. Yet one can with vigilance hold firm the reins to his self, control his unruly impulses, understand his place in the world, guide his actions by reason, maintain his self-reliant independence. And in this way, though he finally perish, man can keep his human dignity and respect, and die with cosmic good manners.

Way 11. The contemplative life is the good life. The external world is no fit habitat for man. It is too big, too cold, too pressing. Rather it is the life turned inward that is rewarding. The rich internal world of ideals, of sensitive feelings, of reverie, of self-knowledge is man's true home. By the cultivation of the self within, man alone becomes human. Only then does there arise deep sympathy with all that lives, an understanding of the suffering inherent in life, a realization of the futility of aggressive action, the attainment of contemplative joy. Conceit then falls away and austerity is dissolved. In giving up the world one finds the larger and finer sea of the inner self.

Way 12. The use of the body's energy is the secret of a rewarding life. The hands need material to make into clay, to mold. The muscles are alive to joy only in action, in climbing, running, skiing, and the like. Life finds its

zest in overcoming, dominating, conquering some obstacle. It is the active deed which is satisfying, the deed adequate to the present, the daring and adventuresome deed. Not in cautious foresight, not in relaxed ease does life attain completion. Outward energetic action, the excitement of power in the tangible present--this is the way to live.

Way 13. A person should let himself be used. Used by other persons in their growth, used by the great objective purposes in the universe which silently and irresistibly achieve their goal. For persons and the world's purposes are dependable at heart, and can be trusted. One should be humble, constant, faithful, uninsistent. Grateful for the affection and protection which one needs, but undemanding. Close to persons and to nature, and secure because close. Nourishing the good by devotion and sustained by the good because of devotion. One should be a serene, confident, quiet vessel an instrument of the great dependable powers which move to their fulfilment.

The following is part of a study for a Master's Thesis. All information will be held in strictest confidence by the investigator. Complete the following information as it is necessary for the statistical aspects of the study.

Name _____

Age _____ Sex _____

University level (circle) 1st year 2nd year 3rd year
 4th year 5th year

Scale of Numbers to be used. (explained on the following instruction sheet).

7. I like it very much.
6. I like it quite a lot.
5. I like it slightly.
4. I am indifferent to it.
3. I dislike it slightly.
2. I dislike it quite a lot.
1. I dislike it very much.

Answer Sheet for "Ways To Live"

<u>Ways To</u> <u>Live</u>	<u>Your</u> <u>Responses</u>	<u>Ways To</u> <u>Live</u>	<u>Your</u> <u>Response</u>
Way 1.	_____	Way 8.	_____
Way 2.	_____	Way 9.	_____
Way 3.	_____	Way 10.	_____
Way 4.	_____	Way 11.	_____
Way 5.	_____	Way 12.	_____
Way 6.	_____	Way 13.	_____
Way 7.	_____		

APPENDIX B
INQUIRY INSTRUMENT

APPENDIX B

INQUIRY INSTRUMENT

The following information is being collected for a Master's Thesis. All information will be treated as confidential.

Name _____

Instructions

Ten pictures dealing with social issues will be displayed on the screen. After each picture is shown, refer to this paper. For each picture there are three questions.

If you were to study the issue portrayed, indicate which question you would prefer to pursue by using the following scale of numbers.

5 - I would like to pursue this line of inquiry the most.

3 - I would like to pursue this line of inquiry quite a lot.

1 - I would like to pursue this line of inquiry slightly.

For the question you prefer the most, place a 5 in front of it.

For the question you prefer quite a lot, place a 3 in front of it.

For the question you prefer slightly, place a 1 in front of it.

Do you have any questions?

Picture I

_____ Should the Canadian government implement a guaranteed annual income?

_____ What are the reasons for these men being on welfare?

_____ Is welfare the preferred way to deal with unemployment, disabilities, old age?

Picture II

- _____ Do we want people to live in such conditions?
- _____ Should the government take action to remove poverty as evidenced here?
- _____ How many other people must share this living space?

Picture III

- _____ Why is the boy spraying the car?
- _____ Should the adult stop the boys from hosing the car?
- _____ Do we want this kind of action to be considered as a criminal act, or just horseplay?

Picture IV

- _____ What has the man actually done?
- _____ Do you think he should have to answer their questions?
- _____ Should the police question this man on the street?

Picture V

- _____ Will the lady let the salesman in?
- _____ Would you prefer that selling by door-to-door salesmen be controlled as to income areas?
- _____ Should salesmen be required to be registered and carry identification?

Picture VI

- _____ Are we justified in denying a man his freedom?
- _____ What is the offence committed by this man?
- _____ What should be done to improve prison life?

Picture VII

- _____ What should be done to prevent drug use from being more widespread?
- _____ How many cc's are necessary for a freak-out?
- _____ Do you think that confirmed drug addicts should be provided with free drugs under medical control?

Picture VIII

- _____ Is this the preferred way to ensure Canadian unity?
- _____ What other methods can be used to control crowds?
- _____ What are the police expecting to happen?

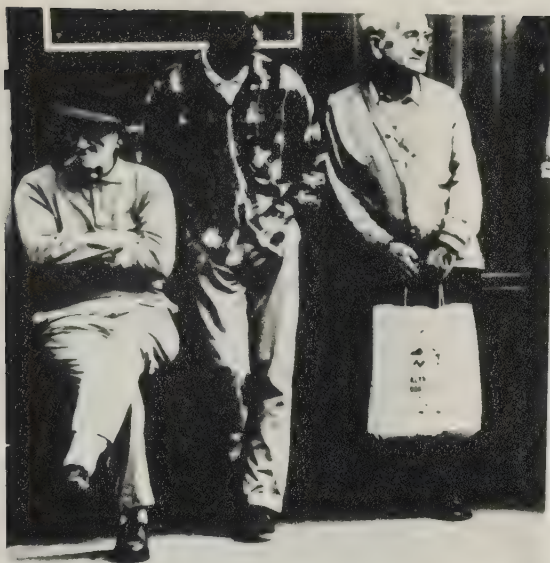
Picture IX

- _____ What should one do to treat alcoholism?
- _____ Has this man consumed the contents of the bottle by himself?
- _____ Should we concern ourselves with this individual's problem?

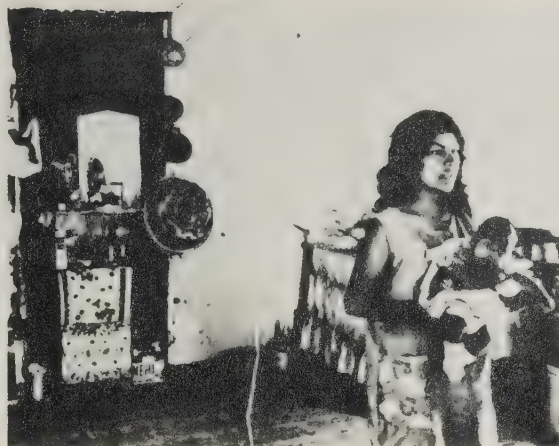
Picture X

- _____ Is this type of situation desirable in Canada?
- _____ What should we do to prevent reoccurrences of this type of event?
- _____ What are the soldiers doing here?

PICTURE I



PICTURE II



PICTURE III



PICTURE IV



PICTURE V



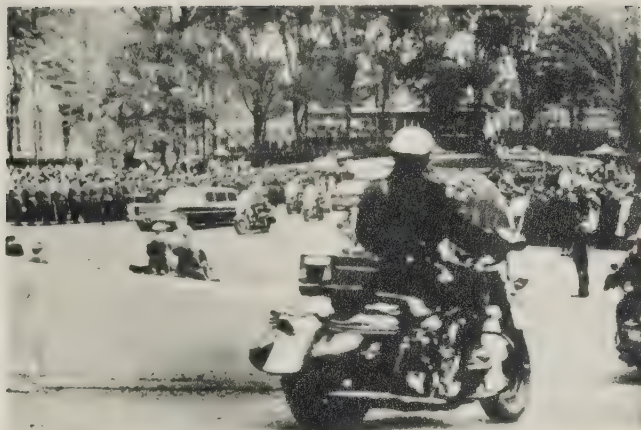
PICTURE VI



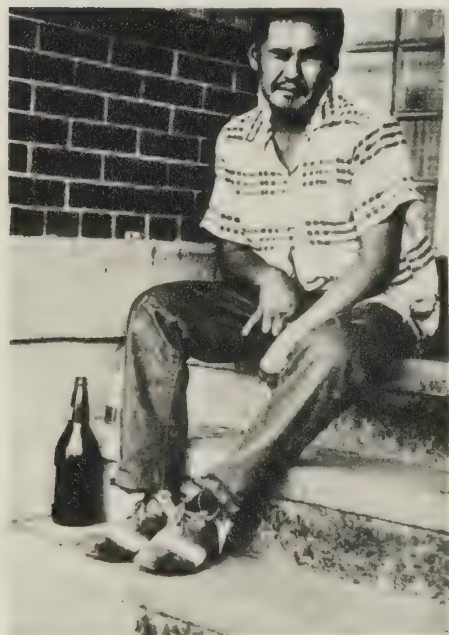
PICTURE VII



PICTURE VIII



PICTURE IX



PICTURE X



APPENDIX C
DATA FROM INQUIRY INSTRUMENT
AND 'WAYS TO LIVE' INSTRUMENT

APPENDIX C

DATA FROM INQUIRY INSTRUMENT AND

'WAYS TO LIVE' INSTRUMENT

ID#.	Ways													Inquiry										IX	X
	1	2	3	4	5	6	7	8	9	10	11	12	13	I	II	III	IV	V	VI	VII	VIII				
0103	2	4	4	6	6	6	6	2	1	2	6	4		315	351	315	135	153	351	135	351	135	351	135	351
0213	6	2	5	5	6	5	4	3	2	5	6	5		513	153	513	531	153	513	153	351	153	351	153	531
0303	2	2	5	6	4	5	7	5	1	4	1	3	1	153	153	513	153	153	135	135	153	135	153	135	531
0403	6	4	6	4	5	5	7	6	4	3	3	6	2	531	153	531	531	351	531	153	531	153	531	153	531
0503	5	6	4	6	3	3	6	4	3	6	2	4	2	315	153	135	315	351	153	135	135	135	135	135	351
0604	5	4	3	1	5	7	6	1	1	7	1	3	4	531	153	315	135	351	351	351	153	153	153	153	153
0713	3	5	4	3	5	4	6	4	5	6	4	6	3	531	153	315	153	135	135	135	135	153	153	153	153
0803	5	5	5	4	3	3	5	5	3	3	4	4	5	315	153	513	531	513	531	153	135	135	135	135	351
0913	5	2	2	3	2	4	7	5	3	5	3	3	3	153	153	135	135	153	135	315	135	135	135	135	513
1004	5	5	5	3	3	4	6	7	5	2	6	3	5	135	135	135	153	153	135	153	135	135	135	153	153
1103	3	6	6	4	4	4	7	4	6	6	5	3	2	153	351	531	531	153	153	135	351	135	351	153	153
1204	3	6	5	7	1	5	5	3	6	3	5	5	1	513	135	513	531	531	135	135	135	135	135	135	153
1303	6	7	6	1	5	4	1	4	3	5	5	6	3	153	153	135	153	351	135	513	153	153	153	351	351
1403	3	5	5	6	7	2	7	4	3	2	4	4	2	153	135	315	351	153	135	153	135	135	153	153	153
1513	3	3	5	5	2	2	5	5	5	1	5	2	3	315	315	513	315	351	153	153	531	135	135	153	153
1613	3	3	5	3	5	4	6	6	5	4	3	4	5	135	135	315	513	153	315	351	513	153	153	513	513
1713	5	2	6	7	1	6	5	5	1	5	2	4	1	315	153	135	135	153	153	135	135	135	153	153	153
1803	5	3	6	2	2	4	6	2	3	3	3	3	4	135	135	153	153	315	153	135	315	153	153	153	153

APPENDIX C (continued)

ID#.	Ways													Inquiry										IX	X
	1	2	3	4	5	6	7	8	9	10	11	12	13	I	II	III	IV	V	VI	VII	VIII				
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2003	4	6	4	2	3	5	7	5	4	5	1	3	1	135	351	513	513	351	351	135	315	153	153	135	135
2103	5	3	4	5	3	4	6	5	3	2	5	4	1	153	351	513	513	351	351	153	135	153	153	351	351
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2713	4	5	6	2	2	5	7	5	5	3	6	4	1	531	153	153	513	351	135	135	351	153	153	351	351
2804	6	2	5	4	3	2	7	5	2	1	1	5	1	135	153	531	513	153	135	153	531	153	153	531	531
2913	2	2	5	2	6	2	7	5	2	5	3	3	2	513	135	513	531	351	153	153	351	153	153	135	135
3003	4	3	5	4	5	6	5	6	6	5	2	4	1	315	135	531	531	351	135	153	315	135	135	135	135
3103	6	3	2	6	5	4	6	6	5	5	5	6	5	513	153	315	531	153	531	135	135	153	153	135	135
3203	5	4	3	5	6	3	6	3	4	3	4	7	3	135	153	135	513	153	153	153	315	153	153	531	531
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3703	6	4	5	6	5	5	5	6	3	5	5	5	3	513	135	315	513	351	351	153	513	135	135	531	531
3813	5	3	5	6	4	4	6	7	2	1	3	5	2	531	153	315	135	513	531	135	531	153	153	531	531
3903	6	5	5	5	5	6	6	5	5	5	5	5	5	351	153	135	531	153	153	153	135	135	135	135	135

APPENDIX C (continued)

ID#.	Ways													Inquiry										IX	X
	1	2	3	4	5	6	7	8	9	10	11	12	13	I	II	III	IV	V	VI	VII	VIII				
4003	5	5	7	4	3	3	6	5	5	5	5	5	4	513	531	135	135	135	153	153	153	135	153		
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4203	3	3	4	4	3	4	6	4	3	5	3	2	2	513	153	315	315	351	351	153	351	153	351		
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4513	2	1	5	3	5	2	6	6	1	3	1	6	1	351	531	513	531	513	135	135	315	153	153		
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4703	4	3	6	5	3	2	6	7	6	2	5	7	2	531	153	513	513	351	153	315	513	135	135		
4803	3	3	5	5	2	4	6	6	5	2	3	5	3	531	135	315	135	351	135	315	135	153	153		
4903	2	4	5	5	6	5	6	7	1	4	3	5	4	153	153	513	531	135	135	135	513	135	135		
5003	4	2	3	4	5	6	7	4	2	1	2	5	3	513	351	153	315	351	135	351	351	153	153		
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5503	6	5	4	5	4	5	7	5	4	3	3	4	3	351	153	135	153	153	153	153	135	135	135		
5613	6	2	5	3	6	5	4	6	5	3	2	5	1	315	153	153	135	153	153	153	153	153	153		
5703	6	7	4	5	6	7	3	7	2	3	5	7	1	513	153	315	315	351	153	153	351	153	531		
5804	5	2	4	6	7	7	6	5	4	1	1	5	1	153	135	153	153	351	153	135	135	153	135		
5903	5	6	4	3	3	2	7	5	7	4	6	2	1	513	135	315	531	153	351	153	153	153	153		

APPENDIX C (continued)

ID#.	Ways													Inquiry									
	1	2	3	4	5	6	7	8	9	10	11	12	13	I	II	III	IV	V	VI	VII	VIII	IX	X
6013	2	4	6	6	6	7	7	6	5	4	7	3	2	315	135	315	513	531	315	153	531	135	531
6113	3	4	5	1	1	6	3	6	2	1	1	6	2	513	153	513	513	531	351	135	351	153	351
6213	2	3	3	5	5	3	6	6	5	3	2	6	1	135	135	315	135	351	153	153	351	153	153
6303	2	2	5	5	3	3	6	4	3	3	2	6	2	315	315	315	513	513	315	153	135	135	351
6403	3	5	6	4	4	4	6	1	5	2	3	4	1	513	153	153	153	135	135	135	135	135	135
6503	6	2	4	5	2	3	5	4	4	2	3	5	4	153	135	315	153	351	135	153	135	135	135
6603	5	3	4	6	6	5	5	7	2	3	1	6	4	153	153	513	315	153	153	153	153	153	513
6703	6	5	7	2	4	6	5	3	5	5	4	4	3	315	315	513	531	153	351	153	351	153	153
6813	2	1	5	2	5	4	6	7	3	1	3	6	1	135	351	513	135	153	153	135	135	153	153
6913	6	2	4	5	5	4	5	7	6	3	4	6	3	135	153	513	513	153	135	153	153	135	531
7013	2	5	3	6	5	3	7	6	5	4	3	5	2	531	153	513	513	153	135	153	351	153	351
7103	2	2	6	2	5	6	7	5	2	1	5	2	2	351	153	315	513	153	315	135	351	153	531
7203	5	3	4	5	6	4	5	6	4	3	4	5	3	135	153	135	513	135	153	153	135	153	135
7314	3	4	5	4	3	4	6	4	3	5	5	5	1	153	135	315	135	153	135	135	135	135	135
7403	3	1	3	5	5	4	5	6	4	2	4	5	2	315	135	531	351	153	531	153	351	153	531
7513	3	3	6	3	3	2	7	4	2	3	5	1	3	351	135	513	153	153	135	315	315	135	135
7613	6	5	6	6	4	7	7	7	4	2	3	6	1	531	315	315	531	153	135	153	153	135	153
7703	5	3	2	3	5	2	6	7	2	1	3	5	2	153	135	135	513	153	531	153	531	135	351
7804	3	2	3	5	2	4	6	2	2	4	3	5	2	153	153	513	153	351	153	135	135	153	135

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